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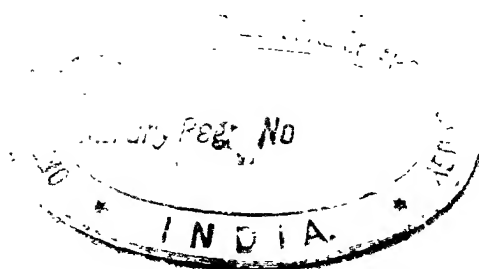
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THE  
JOURNAL  
OF THE  
ROYAL GEOGRAPHICAL SOCIETY.

VOLUME THE THIRTY-SIXTH.



910.E  
J.R.G.S.

1866.

EDITED BY THE ASSISTANT-SECRETARY.

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# Royal Geographical Society.

1866.

## REPORT OF THE COUNCIL,

READ AT THE ANNIVERSARY MEETING ON THE 28TH MAY.

THE Council have the pleasure of submitting to the Fellows the customary Annual Report of the financial state and general progress of the Society.

*Members.*—The number of Fellows has again been largely increased during the year. Since the last Report 157 new Members have been elected, namely, 151 Ordinary (of whom 19 have paid their life compositions), 1 Honorary, and 5 Honorary Corresponding. But during the year the Society has lost 81 Fellows, five of whom were Honorary Corresponding: 57 have been lost by death, 22 by resignation, and 2 have been removed by order of the Council. The total number on the list at the end of April was 2089 Ordinary, 5 Honorary, and 63 Honorary Corresponding Members. At the same date last year the number of Ordinary Members was 1997, and in the previous year (1864) 1907.

*Finances.*—The Balance-sheet (Appendix A) shows that the receipts (exclusive of balance in hand) exceeded the estimate by the sum of 302*l.* 18*s.* 3*d.*, and that the expenditure has fallen short of the estimated amount by 305*l.* 15*s.* 7*d.* In consequence of these favourable results, the Council have been enabled to add 1000*l.* India 5 per Cents. to the funded property, notwithstanding the large sum of 800*l.* spent in expeditions; but the anticipated balance

in hand has been thereby reduced to 99*l.* 4*s.* 10*d.* The Society's income was, in 1865, 4905*l.* 8*s.* 3*d.*, and in 1864 4977*l.* 8*s.* 6*d.* The expenditure in 1865 was 4307*l.* 4*s.* 5*d.*, and in 1864 3647*l.* 7*s.* 10*d.* The increase in the expenditure last year is accounted for by the large sum spent in the promotion of expeditions.

The funded property of the Society now amounts to 13,500*l.*, 11,500*l.* of which are invested in New 3 per Cents. and 2000*l.* in India 5 per Cents.; 1000*l.* have been added since December 31, 1865, the end of the financial year. This sum exceeds by 500*l.* the total amount of life compositions of living compounders, the number of whom on the 30th of April last was 520. In 1864, as may be seen in the Council Report of that year, the reserved Fund fell short of the life compositions by nearly 2000*l.*, notwithstanding the great improvement effected during the same year. The sound condition which the monetary affairs of the Society have now attained is due chiefly to the vigilance of the Finance Committee throughout the last three years.

A legacy of 4000*l.* has been bequeathed to the Society by one of its members, the late Benjamin Oliveira, Esq. The bequest formed one of several left to various institutions, and the personal estate of the testator not sufficing to pay the whole in full, the executors filed a bill in Chancery with a view to the equitable apportionment of the assets. The solicitors to the executors having selected, from the number of legatees, the Royal Geographical Society to defend the suit, the Council were recommended by their legal advisers to appear in it, and they are now informed that there is good prospect of an early and favourable adjudication.

The system of monthly examination of the accounts by the Finance Committee, established in 1864, has been continued throughout the year, and all bills due by the Society are paid at the next monthly meeting following their presentation. As will be seen in the Balance-sheet (Appendix A), the accounts have been audited to the end of the year 1865; they have also been examined to the end of April in the present year.

STATEMENT showing the RECEIPTS and EXPENDITURE of the Society from the Year 1848 to the 31st Dec. 1865.

STATEMENT showing the PROGRESS of the INVESTMENTS of the Society from the Year 1832 to the 31st Dec. 1865.

Year.	Cash Receipts within the Year.			Cash Amounts invested in Funds.			Deducting Amounts invested in Funds; actual Expenditure.	End of the Year, Dec. 31.	Cash invested.			Amount of Stock purchased.		
	£.	s.	d.				£. s. d.		£.	s.	d.	£.	s.	d.
1848	696	10	5	..	..		755 6 1	1832	3637	10	0	4000	0	0
1849	778	3	0	..	..		1098 7 6	1833	4130	0	0	4500	0	0
1850	1036	10	5	..	..		877 2 10	1834	4426	0	0	4800	0	0
1851	1056	11	8	..	..		906 14 7	1835	4426	0	0	4800	0	0
1852	1220	3	4	..	..		995 13 1	1836	4426	0	0	4800	0	0
1853	1917	2	6	..	..		1675 6 0	1837	4426	0	0	4800	0	0
1854	2565	7	8	..	..		2197 19 3	1838	4426	0	0	4800	0	0
1855	2584	7	0	..	..		2636 3 1	1839	4129	15	0	4500	0	0
1856	3372	5	1	533	10 0		2814 8 1	1840	3788	10	0	4150	0	0
1857	3142	13	4	378	0 0		3480 19 9	1841	2801	0	0	3150	0	0
1858	3089	15	1	..	..		2944 13 6	1842	2801	0	0	3150	0	0
1859	3471	11	8	950	0 0		3423 3 9	1843	2219	18	6	2578	4	4
1860	6449	12	1	466	17 6		5406 3 7	1844	2219	18	6	2578	4	4
1861	4792	12	9	1358	2 6		3074 7 4	1845	2219	18	6	2578	4	4
1862	4659	7	9	1389	7 6		3095 19 4	1846	1933	1	0	2278	1	4
1863	5256	9	3	1837	10 0		3655 4 0	1847	2123	1	0	2502	6	2
1864	4977	8	6	1796	5 0		3647 7 10	1848	1886	16	8	2224	1	10
1865	4905	8	3	1041	5 0		4307 4 5	1849	1886	16	8	2224	1	10
								1850	1886	16	8	2224	1	10
								1851	1886	16	8	2224	1	10
								1852	1886	16	8	2224	1	10
								1853	1662	14	10	2000	0	0
								1854	1662	14	10	2000	0	0
								1855	1662	14	10	2000	0	0
								1856	2216	4	10	2600	0	0
								1857	2594	4	10	3000	0	0
								1858	2594	4	10	3000	0	0
								1859	3544	4	10	4000	0	0
								1860	4011	2	4	4500	0	0
								1861	5369	4	10	6000	0	0
								1862	6758	12	4	7500	0	0
								1863	8596	2	4	9500	0	0
								1864	10365	7	4	11500	0	0
								1865	11406	12	4	12500	0	0*

\* Of which 1000*l.* is India 5 per Cents.

*Arrears.*—Since the last anniversary the subject of arrears of subscription has been carefully inquired into by the Finance Committee, and they have now recommended to the Council that Clause 4, Chap. IV., of the Regulations, which requires the removal from the list of Fellows of all those who are defaulters for three years be put in force against those who shall not have paid their arrears by the 1st of August next.



As subscriptions sometimes fall in arrear on Members leaving England, it is recommended to all who are going abroad and wish to retain their connection with the Society, to leave with the Secretaries a standing order on their Agents for the payment of their subscriptions, forms of which can be obtained at the Society's rooms.

*Free-list.*—The Council have considered that it would advance the interests of the Society to admit a very limited number of gentlemen to the Fellowship who, although distinguished for their services to Geography and desirous of belonging to the Society, have not the means to enable them to do so. They have, therefore, to submit to the Meeting a new Clause, proposed to be added to Chap. II. of the Regulations, which, if approved of, will empower them to remit the usual payments in these cases.

*Publications.*—The Council have great satisfaction in announcing that the volume of the Journal has this year been issued at a much earlier date than has been the case for many years past, having been published on the 9th of April. It comprises an average number of important memoirs, and the attention of Fellows is especially directed to the valuable series of original Maps that it contains, some of which have been compiled after much research and at considerable cost.

The 9th volume of Proceedings has also been completed and delivered to the Members since the last anniversary, and three parts of the 10th volume, containing the Reports of the Meetings of the present Session down to the 12th of March, have been issued.

The Council have again the pleasure of reporting an increase in the sale of publications during the past year, the amount being 124*l.* 4*s.* 4*d.* In the year 1864 the total sales were 105*l.* 12*s.* 7*d.*, and in 1863 65*l.* 8*s.* 8*d.*

*Library.*—406 volumes of Geographical and other works have been added to the Library since the last Report, 39 of which were purchased.

The re-arrangement of the Library undertaken on the completion of the Catalogue last year is nearly finished, and greater facilities are now afforded to those Members who wish to make use

of this large collection of Geographical works for the purpose of research. The Library Committee have in contemplation the expenditure of the sum of 100*l.*, voted by the Council the previous year for additions to the Library, and invite Members to propose such books as they may deem necessary to be acquired, by inscribing their titles in the Recommendation Book kept for this purpose in the Library.

*Map-Collection.*—The accessions to this department since the last anniversary have been above the average, consisting of 2109 sheets of Maps and Charts, 9 Atlases, and 7 Diagrams.

The Map-room continues to be visited by a large number of Fellows, travellers, and the general public, for the purpose of consulting the collection.

The following accessions deserve especial notice:—

1636 sheets of the Ordnance Maps of Great Britain and Ireland, on various scales. Presented by the Topographical Office.

63 Charts. Presented by the Admiralty.

46 Maps, on 106 sheets, of the India Survey, presented by the India Office through Colonel Thuillier, Surveyor-General of India.

9 Sheets of the Topographical Map, and

5 Sheets of the Geological Survey of Sweden. Presented by the Swedish Government.

6 Sheets of the large Topographical Map of Denmark. Presented by the Danish Government.

7 Sheets of the Basin of the Amur. Presented by M. Schwartz.

94 Charts. Presented by the French Minister of Marine.

Atlas of Queensland. Presented by the Governor of Queensland.

Atlas and Maps of the United States of Columbia. Presented by the Grand General T. C. de Mosquera.

Raaz's Relief Atlas, on 4 sheets, in photolithography.

Ziegler's Hypsometrical Map of Switzerland. Presented by the Author.

Kiepert and Lepsius' Maps of the Nile Valley. Presented by Dr. Kiepert.

Kiepert's Russia in Europe. Presented by Dr. Kiepert.

6 Sheets of Map of Eastern Europe. Presented by Dr. Petermann.

Nordenskiöld's Chart of Spitzbergen. Presented by the Author.

Richardson's Survey Route of Jardine's Expedition. Presented by the Governor of Queensland.

6 Sheets of the Official Survey of the Argentine Republic. Presented by Don Saturnino Salas, Hon. Corr. Mem. R.G.S.

MS. Survey Map of the River Purûs. Presented by W. Chandless, Esq., M.A.

*Large Diagrams.*—A Special Committee of Council, consisting of Vice-Admiral Sir George Back, Rear-Admiral R. Collinson, and Major-General G. Balfour, has been engaged during the present Session in directing the construction of large Diagrams for the illustration of Papers at the evening Meetings, and to complete the series of which the Society's large Maps of Africa and Australia form part. Four of these Diagrams have been determined upon,—namely, Asia, the Malay Archipelago, South America, and the World on Mercator's projection; and great pains are being taken to ensure correctness by consulting personally some of the best living authorities on the various countries. It is hoped that the Diagram of Asia will be ready at the commencement of the next Session.

The Committee has also taken steps to ensure the completion of a Catalogue of the Maps in the Society's collection, and has obtained the sanction of Council to the appointment of an extra Assistant to aid in its compilation. At the next anniversary the Council hope to be able to report the termination of this work, which will give additional facilities to the consultation of the great stores of Maps now in the Society's possession.

*Grants to Travellers.*—The sum of 800*l.* 8*s.* 3*d.* was expended, during the year 1865, in grants made to promote new explorations. Of this 500*l.* was given to Dr. Livingstone, in aid of his expedition to the Lakes of Central Africa; 107*l.* 7*s.* 9*d.* to Sir Henry James, towards the expenses of the settlement of the level of the Dead Sea, undertaken by Captain Wilson, R.E.; 143*l.* 0*s.* 6*d.* in money, and instruments to Mr. R. B. N. Walker, who is exploring Western Equatorial Africa from the Gaboon; and 50*l.*, in addition to 50*l.* previously given, to M. Gérard Rohlfs, who has undertaken a journey to the Sultan of Waday, in the hope of recovering the Papers of the unfortunate Vogel.

During the present year the sum of 250*l.* has already been given to travellers or in aid of expeditions, the details of which appear in the estimate for the current year's expenses.

## BALANCE-SHEET FOR THE YEAR 1865.

*Expenditure.*

[illegible]

Audited 28th March, 1866.

THOMAS H. BROOKING,  
G. BALFOUR,  
CHARLES WHITE,  
H. JONES WILLIAMS,

*Auditors.*

## APPENDIX B.

## ESTIMATE FOR THE YEAR 1866.

<i>Receipts.</i>	<i>£. s. d.</i>				<i>Expenditure.</i>		
	<i>£.</i>	<i>s.</i>	<i>d.</i>		<i>£.</i>	<i>s.</i>	<i>d.</i>
Cash Balance, 1st Jan., 1866	..	..	..	..	Journal, with Maps, and Proceedings	..	..
Annual Subscriptions	..	..	..	..	Rent, Taxes, and House Expenses	..	..
Life Compositions	..	..	..	..	Salaries (whole Staff) and Wages	..	..
Entrance Fees	..	..	..	..	Library and Map-rooms	..	..
Arrears of Subscriptions	..	..	..	..	Office Expenses	..	..
Royal Premium for 1865 and 1866	..	..	..	..	Postages	..	..
Parliamentary Grant	..	..	..	..	Gold Medals and other Awards	..	..
Sale of Publications	..	..	..	..	EXPENDITURES:—	<i>£.</i>	<i>s. d.</i>
Dividends and Small Receipts	..	..	..	..	In search of Leichhardt	..	..
Compensation for Stables taken by the Waterloo and	..	..	..	..	M. Gerhard Rohlfs	..	..
Whitchall Railway	..	..	..	..		250	0 0
						3947	5 0
					Available for investment	..	..
					Balance	..	..
						71	19 10
						£5019	4 10

## Library Regulations.

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I. The Library will be open every day in the week (Sundays excepted) from 10:30 in the morning to 4:30 in the afternoon,\* except on New-Year's Day, Good Friday to Easter Monday inclusive, and Christmas week: and it will be closed one month in the year, in order to be thoroughly cleaned, viz. from the first to the last day of September.

II. Every Fellow of the Society is entitled (*subject to the Rules*) to borrow as many as four volumes at one time.

*Exceptions :—*

1. Dictionaries, Encyclopædias, and other works of reference and cost, Minute Books, Manuscripts, Atlases, Books and Illustrations in loose sheets, Drawings, Prints, and unbound Numbers of Periodical Works, *unless with the special written order of the President.*
2. Maps or Charts, *unless by special sanction of the President and Council.*
3. New Works before the expiration of a month after reception.

III. The title of every Book, Pamphlet, Map, or Work of any kind lent, shall first be entered in the Library-register, with the borrower's signature, or accompanied by a separate note in his hand.

IV. No work of any kind can be retained longer than one month: but at the expiration of that period, or sooner, the same must be returned free of expense, and may then, upon *re-entry*, be again borrowed, provided that no application shall have been made in the mean time by any other Fellow.

V. In all cases a list of the Books, &c., or other property of the Society, in the possession of any Fellow, shall be sent in to the Secretary *on or before the 1st of July in each year.*

VI. In every case of loss or damage to any volume, or other property of the Society, the borrower shall make good the same.

VII. No stranger can be admitted to the Library except by the introduction of a Fellow, whose name, together with that of the Visitor, shall be inserted in a book kept for that purpose.

VIII. Fellows transgressing any of the above Regulations will be reported by the Secretary to the Council, who will take such steps as the case may require.

By Order of the Council.

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\* On Saturday the Library is closed at 2:30 p.m.

# ROYAL GEOGRAPHICAL SOCIETY.

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## Vice-Patron.

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H. W. BATES, Esq.

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1867.

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ERMAN, Prof. Adolph .. .. Berlin	MADOZ, Don Pascual .. .. Madrid
FÄLDHERBE, Col., French Gov. of the Sene-	MALLET-BRUN, M. V. A., Sec. Geogr. Soc.
gal .. .. West Africa	of .. .. Paris
FIGANIÈRE, Command. Jorge César,	MARTIUS, Dr. Charles von .. .. Munich
Foreign Office, Lisbon	MAURY, Commodore M. F.
FREMONT, General .. .. New York	NARDI, Monsignor Francesco .. .. Rome
GRINNELL, Henry, Esq. V.P. Geogr. Soc.	NEGRI, Chevalier Cristoforo .. .. Turin
of .. .. New York	PLEIERMANN, Dr. Augustus .. .. Gotha
GUYOT, Prof., LL.D., Princeton, New Jersey	PHILIPPI, Dr. Rodolfo Armando .. .. Chili
HADINGER, Dr. William, V.P. Imp. Geogr.	PLATEN, His Excellency Count.
Soc. of .. .. Vienna	RAYMOND, Don Antonio .. .. Lima



RANUZZI, Count Annibale .. .. Bologna	STRUVE, Prof. Otto, Imp. Observ. of Pul-
RÜPPELL, Dr. E., For. M.L.S. . . . Frankfurt	kowa .. .. St. Petersburg
SALAS, Don Saturnino, Pres. Topo. Depart.,	TOCHHATCHEF, M. Pierre de .. Paris
Argentine Repub. .. .. Buenos Ayres	TSCHUDI, Herr T. T. von .. .. Vienna
SCHEDA, Herr von, Director of the Imp.	VANDER MAELEN, Mr. Ph. .. Brussels
Inst. of Military Geogr. .. .. Vienna	VILLAVICENCIO, Don Manuel Guayaquil
SCHERZER, Lt. Karl von .. .. Vienna	WORCESTER, J. E., Esq. . . Cambridge, U.S.
SOLDAN, Don Marino Felipe Paz,	WRANGELL, Admiral Baron,
Lima, and 21A, Hanover square, W.	St. Petersburg
SONKLAR, Lieut.-Col. the Chev. de,	ZIEGLER, M. J. M. .. .. Winterthur
Wiener, Neustadt, Vienna	

## F E L L O W S.

(To 15TH MARCH, 1867.)

N.B.—Those having \* preceding their names have compounded for life.

Year of Election.	
1865	Abbott, Hon. Reginald C. E. <i>All Souls' College, Oxford.</i>
1863	Aldy, Rev. Albert, M.A. <i>Worcester Coll., Oxford; and Streatham.</i>
1860	Â Beckett, Arthur M., Esq., F.R.C.S.I.
1851	Abinger, W. F. Scarlett, Lord. <i>Guards Club, S.W.</i>
1865	Acheson, Frederick, Esq., C.E. 7, <i>College-lane, Highgate-park, North. N.</i>
1861	Acland, J. Barton Arundel, Esq. <i>Mount Peel, Canterbury, New Zealand. Care of A. Mills, Esq., 34, Hyde-park-garden, W.</i>
1853	Acland, Sir Peregrine Palmer F. P., Bart. <i>Fairfield, Somerset.</i>
1830	*Acland, Sir Thomas Dyke, Bart., F.R.S. <i>Waterloo-hotel, Jermyn-street, S.W.; and Killerton, Lxeter, Devon.</i>
1867	Adair, Col. Alex. Sholto. 7, <i>Ample-square, W.</i>
1867	10 Adare, Viscount. <i>Clewell Court, Coleford, Gloucestershire.</i>
1861	Addington, Right Hon. H. U. 78, <i>Eden-place, S.W.</i>
1862	Addison, Col. Thomas, C.B. <i>Aldershot.</i>
1859	Ainslie, Col. H. Francis. <i>Junior United Service Club, S.W.; and Burlington-chambers, 180, Piccadilly, W.</i>
1830	*Ainsworth, W. Francis, Esq., F.R.S. <i>Roxen-court-villa, New-road, Hammersmith, W.</i>
1859	Airlie, David Graham, Earl of. <i>Holly-lodge, Kensington, W.</i>
1860	Atchison, David, Esq. 180, <i>Piccadilly, W.</i>
1830	*Albemarle, George Thomas, Earl of. 11, <i>Greenour-square, W.; Quiddenhall-hall, Litchford, Norfolk; and Lichen-hall, Suffolk.</i>
1862	Alcock, Sir Rutherford, K.C.B. <i>Athenæum Club, S.W.</i>
1838	*Aldam, William, Esq. <i>Fiddle-hill, near Dover.</i>
1865	20 Aldom, Joseph R. Esq., M.A., PH. DE. <i>Salway-house, Lepton, Essex.</i>
1857	Aldrich, Captain Robert D., R.N. <i>Windmill-road, Croydon, Surrey, S.</i>
1830	Alexander, Colonel Sir Jas. Ed., K.C.L.S., F.R.A.S., F.R.S.E., etc., 14th Regt. <i>United Service Club, S.W.; and Wisterton-house, Bridge of Alton, N.B.</i>
1864	Allan, C. H., Esq. <i>Moyle's, E.C.; and 31, Park-street, Stoke Newington, N.</i>
1857	Allan, G. W., Esq. <i>Toronto, Canada.</i>
1858	Allan, Jas., Esq. 122, <i>Leadenhall-street, E.C.</i>
1865	Allen, James Pearce, Esq. 13, <i>Waterloo-place, S.W.</i>

Year of  
Election.

- 1859 Alsager, Thos. H., Esq. *Reform Club, S.W.; and Chislehurst, Kent.*
- 1854 Ancona, J. S., Esq. 8, *John-street, Adelphi, W.C.*
- 1860 Anderdon, John Edmund, Esq. 4, *Stanhope-street, Hyde-park-gardens, W.*
- 1863 30 Anderson, Arthur, Esq. *Norwood-grove, Norwood, S.*
- 1867 Anderson, H. L., Esq. *India-office, Victoria-street, S.W.*
- 1862 Anderson, James, Esq. 1, *Billiter-court, City, E.C.*
- 1861 Anderson, John, Esq. Messrs. W. R. Adamson and Co. *Shanghai. Cure of Messrs. Jno. Burd and Co., Hong Kong. Per Messrs. Adam, Thomson, and Co., 48, Lime-street, E.C.*
- 1861 \*Anderson, Col. W., C.B. 19, *Gloucester-square, Hyde-park, W.*
- 1856 \*Andrew, William P., Esq.
- 1866 Andrews, John R., Esq. *East Hill House, Wimbledon, S.W.*
- 1861 Annesley, Col. the Hon. Hugh, M.P. 25, *Norfolk-street, Park-lane, W.*
- 1860 \*Anson, Sir John William Hamilton, Bart. 55, *Portland-place, S.W.; and Sherley House, Croydon.*
- 1853 Ansted, Prof. D. T., M.A., F.R.S., etc. 33, *Brunswick-square, W.C.; Athenaeum Club, S.W.; and Bonar St. Martin, Guernsey.*
- 1863 40 Anstey, G. A., Esq.
- 1857 Anstruther, M.-Gen. Philip, C.B., Madras Artill.
- 1864 Anstruther, Lieut. R. L., Rifle Brigade. *Montreal, Canada. Cure of Lt.-Col. L. Anstruther, Hintlesham Hall, Ipswich.*
- 1830 \*Antrobus, Sir Edmund, Bart. 146, *Piccadilly, W.; Lower Cheam, Epsom, Surrey; and Amesbury, Wilts.*
- 1863 Arber, Edward, Esq., A.K.C. *Admiralty, W.C.; Civil Service Club, S.W.*
- 1858 Arbuthnot, George, Esq. 23, *Hyde-park-gardens, W.*
- 1862 Arbuthnot, Lieut. George, R.H.A. *Coworth, Sunningdale.*
- 1860 Arcebeckne, Andrew, Esq. 35, *Albemarle-street, W.*
- 1861 Archer, Graves Thos., Esq. 1, *Leamington-place, Prince's-gate, S.W.*
- 1866 Arconati, The Marquis Giannmarino. *Casa Prati, Pisa. Cure of Mr. Bernard Quaritch, 15, Piccadilly, W.*
- 1855 50\*Arden, Richard Edward, Esq. *Somerset-park, Middlessex, S.W.*
- 1858 \*Armistead, Rev. Charles John, M.A., J.S.A. *University Club, S.W.; National Club, S.W.; and Romdhay, near Leeds; H.M.S. 'Pembroke,' Harwich.*
- 1863 Armitage, Edward, Esq. 3, *Holborn, St. John's-road, N.W.*
- 1857 Armstrong, Alexander, Esq., M.D., R.N., F.R.C.P., Deputy Inspector-General, Royal Melville Hospital, Chatham. *Junior United Service Club, S.W.*
- 1866 Arran, Philip York, Earl of. *Palmer House, Hans-place, Sloane-street, S.W.; and Soubise-court, Weyford, Irehon.*
- 1830 \*Arrowsmith, John, Esq., F.R.A.S. 35, *Hereford-square, Old Brompton, S.W.*
- 1864 Arthur, John, Esq. 9, *Notting-hill-square, W.*
- 1863 Arthur, Commander William, R.N. *H.M.S. 'Excellent,' Portsmouth.*
- 1858 Ashburton, Lord. *Bath House, Piccadilly, W.*
- 1864 \*Ashton, R. J. Esq. *Hutton Court, Threewalle-street, E.C.*
- 1853 60\*Ashwell, James, Esq., M.A., F.R.S.
- 1851 Astley, Francis D. P., Esq., M.B.I. 67, *Edon-square, S.W.*

Year of  
Election.

- 1830 \*Atkins, John Pelly, Esq., F.S.A. *Holsted-place, near Sevenoaks.*
- 1860 Attwell, Professor Henry. *Braes, S.W.*
- 1861 Aubin, William, Esq. 3, *Furnal's-lane, Holborn, E.C.*
- 1859 Austen, Capt. Henry H. Godwin, 24th Foot, Trig. Survey, Panjab. *Junior United Service Club, S.W.; and Chluworth-moor, Guildford, Surrey.*
- 1863 Austin, John G., Esq.
- 1854 Ayrton, Acton S., Esq., M.P. 3, *Essex-court, Temple, E.C.*
- 1845 \*Ayrton, Frederick, Esq.
- 1866 \*Babington, William, Esq., 23, *Fulham-place, Maida-hill, West, W.; and Bonny River, West Coast of Africa.*
- 1836 70 \*Back, Vice-Adm. Sir Geo., D.C.L., F.R.S. 109, *Gloucester-place, Portman-sq., W.*
- 1863 \*Backhouse, John Henry, Esq. *Dorington.*
- 1866 Bacon, Geo. Washington, Esq. 48, *Paternoster-row, E.C.; and 73, Pentonville-road.*
- 1864 Badger, Rev. Geo. P. 17, *Darwin-place, Bayswater, W.*
- 1863 Bagot, Christopher N., Esq. *Oriental Club, W.*
- 1862 Bagot, Capt. L. H. Care of C. S. Bagot, Esq., 5, *New-square, Lincoln's-lan, W.C.*
- 1859 Bailey, L. C., Esq. Staff Commander, R.N. *Typographical Department, New-street, Spring-gardens, S.W.*
- 1857 Baillie, Major John, Bengal Staff Corps. *Jhansi, Central India. Care of Messrs. Gruehn and Co.*
- 1862 Baillie, John B., Esq. *Leys-castle, Inverness.*
- 1861 Baillie, William Henry, Esq.
- 1861 80 \*Baker, John, Esq.
- 1865 Baker, Sir Samuel White. *Holbrook-hall, Banbury, Norfolk.*
- 1862 Baker, Capt. Robert B. *Oriental Club, Henriques-square, W.*
- 1855 Baker, Capt. Wm. T., 85th Regt. *Junior United Service Club, S.W.; and 31, Grosvenor-place, Bath.*
- 1861 Baldwin, William Charles, Esq. *Leighland-lane, Preston.*
- 1861 Balfour, David, Esq. *Balfour-croft, Kilmah, N.B.*
- 1847 Balfour, M-General George, R.A. C.B. 27, *Gordon-street, Gordon-square, W.C.; and Oriental Club, Henriques-square, W.*
- 1853 Balfour, John, Esq. *New South Wales; and Colinton, Queensland; 39, St. James's-street, S.W.*
- 1863 Balfour, John Osborn, Esq. 26, *Inverness-terrace, W.*
- 1863 Balfour, William, Esq. 1, *Spalding-street, Kensington, Hyde-park, W.*
- 1860 70 Ball, John, Esq. *Oxford and Cambridge Club, S.W.*
- 1863 Bamforth, Rev. J., Principal of Doveton College. *Melbous. Care of Messrs. Jackson, Wilford, and Holder, 27, Paternoster-row, E.C.*
- 1852 Baneroff, Capt. W. C., 16th Regt. *Aide de Camp and Military Sec., King's House, Jamaica; McGregor and Co., Charles-street, S.W.*
- 1862 Banks, George F., Esq., Surgeon R.N.
- 1858 Bannerman, Sir Alexander, Bart. *Canonmote, Aberdeenshire.*

Year of  
Election

- 1840 \*Barclay, Arthur Kett, Esq., F.R.S. *Park-street, Southwark, S.E.; and Bury-hill, Dorking, Surrey.*
- 1863 Barford, A. H., Esq., M.A. 1, *Comwall-terrace, Regent's-park, N.W.*
- 1863 Baring, Alexander, Esq. 58, *Louises-square, S.W.*
- 1835 \*Baring, John, Esq. *Oakwood, Chichester.*
- 1844 \*Baring, Thomas, Esq., M.P. 41, *Upper Grosvenor-street, W.*
- 1862 100 Barlee, Frederick Palgrave, Esq. *Care of G. Lawrence, Esq., 9, Old Broad-street, E.C. Perth, Western Australia.*
- 1864 Barnett, H. C., Esq. *Care of Alice Wrayton, Esq., 9, George-st., Edinburgh.*
- 1858 Barratt, James, Esq. *Lynton-hill, near Harrington, Cheshire.*
- 1862 Burrett-Lemaud, Capt. C. E. 7, *Athemark-street, W.*
- 1859 Bannington, Lord. 19, *Hertford-street, Mansfield, W.*
- 1833 Barrow, John, Esq., F.R.S., F.S.A. 17, *Hummer-terrace, Regent's-park, N.W.*
- 1863 Barry, Alfred, Esq. *Beechenham, Kent, S.W.*
- 1857 Batholomew, John, Esq. 4, *North-bridge, Edinburgh.*
- 1861 Bartlett, Herbert Lewis, Esq. *Union Club, S.W.*
- 1862 Barton, Alfred, Esq., M.D. *Oriental Club, W.; and Hampton Court.*
- 1864 110 Baseri, Capt. J. P., R.E. 109, *Belgrave-road, S.W.; Messrs. Grimley & Co, Parliament-street, S.W.*
- 1837 \*Bateman, James, Esq., F.R.S., L.S. *Knapersley-hill, Staffordshire.*
- 1859 Bateman, John F., Esq., C.E. 16, *Great George-street, Westminster, S.W.*
- 1866 Bates, Henry Walter, Esq., F.Z.S. 15, *Whitehall-place, S.W.*
- 1866 Bateson, George, Esq. 45, *Green-street, Park-lane, W.*
- 1866 Batten, John H., Esq. 'Prox.' to *Roseman, Penance; and Oriental Club, Hummer-square, W.*
- 1864 Bux, Capt. Henry G. 2, *Sussex-place, Hyde-park-gardens, W.*
- 1867 Baxter, Richard, Esq. (Barrister-at-Law). 19, *Lancaster-gardens, Bayswater, W.*
- 1858 Baxendale, Joseph H., Esq. 14, *Chester-terrace, Regent's-park, N.W.; and Scott's-bridge, near Rickmansworth, Herts; Castle Inn, Wood-street, E.C.*
- 1863 Bayley, H. Esq. *Blackheath-park, Kent.*
- 1862 120 Bayly, Lieut.-Col. John, R.E. *Ordnance Survey Office; 131, St. George's-road, Pimlico, S.W.*
- 1862 Baynes, Lieut.-Col. R. Stuart. *Army and Navy Club, S.W.; and 38, Jermyn-street, S.W.*
- 1852 Beardmore, Nathaniel, Esq., C.E. 39, *Great George-street, Westminster, S.W.*
- 1858 Beauclerk, Aubrey de Vere, Esq. *Ardfjoss, Co. Belfast.*
- 1854 Beaufort, William Morris, Esq., Bengal Civil Service. *Bengal.*
- 1856 Beaumont, John Aug., Esq. *Wimbledon-park-house, Wimbledon, S.W.; and 50, Regent-street, W.*
- 1851 \*Beaumont, Wentworth B., Esq., M.P. 144, *Piccadilly, W.; Bynell-hall, Newcastle-upon-Tyne; and Dutton-park, Wakefield.*
- 1863 Beavan, Hugh J. C., Esq., F.A.S.L. 13, *Blomford-square, Regent's-park, N.W.; 4, Mills-temple-lane, E.C.; and Junior Carlton Club, S.W.*
- 1865 Bebb, Horatio, Esq. 13, *Gloucester-place, W.; and Leamington.*

Year of  
Election.

- 1861 Beckett, James F., Esq., Staff Commander, R.N., F.R.S.A. 6, *Boyne-terrace, Notting-hill, W.* Journals, 'Proc.,' &c., to care of Captain George.
- 1838 130\* Beckford, Francis L., Esq. *Travellers' Club, S.W.*
- 1859 Bedford, Capt. G. Augustus, R.N. 5, *Orion-street, Regent's-park, N.W.*
- 1869 Beeton, Samuel Orchard, Esq. 248, *Strand, W.C.*; and *Finzer, Middlesex, W.*
- 1861 \*Begbie, James, Esq. 27, *Mark-lane, E.C.*
- 1860 Begbie, Thomas Stirling, Esq. 4, *Mansion-house-place, E.C.*
- 1846 Beke, Charles Tiltstone, Esq., PH. DR., F.S.A., &c. *Beckesbourne-house, near Canterbury.*
- 1853 Belcher, Rev. Brymer. *St. Gabriel's, Pimlico, S.W.*
- 1830 \*Belcher, Rear-Adm. Sir Edward, C.B., F.R.A.S. 22A, *Connaught-square, W.*
- 1858 Bekham, Edw., Esq. 1, *Stone-buildings, Lincoln's-inn, W.C.*; and *Royston, Herts.*
- 1863 Belmore, The Earl of. *Door-street, Piccadilly, W.*
- 1863 140\* Bell, Charles, Esq. *Richmond.*
- 1858 Bell, C. Davidson, Esq., Surveyor-General, Cape of Good Hope. *Cape Town. Care of the S. A. Pub. Library, Cape Town. Per Messrs. Smith, Elder, and Co.*
- 1830 \*Bell, James Christian C., Esq. 42, *Westbourne-terrace, W.*; and 15, *Angel-court, Throgmorton-street, E.C.*
- 1864 Bellamy, Edward, Esq. 10, *Duke-street, St. James's, S.W.*
- 1830 \*Bennett, John Joseph, Esq., F.R.S. *British Museum, W.C.*
- 1857 Bennett, J. Rislon, Esq., M.D. 15, *Finchbury-square, E.C.*
- 1856 \*Benson, Robert, Esq. 16, *Crown-hill-jardens, Bayswater, W.*
- 1856 \*Benson, William, Esq., Barrister-at-Law. 16, *Crown-hill-jardens, Bayswater, W.*
- 1830 Bentham, George, Esq., Pres. L.S. 25, *Wilton-place, S.W.*
- 1833 Bentley, Richard, Esq. *New Parliament-street, W.*
- 1859 150 Berens, H. Hulse, Esq. *Saltcross, Fife's Cray, Kent.*
- 1861 Berkley, George, Esq., C.E. 24, *Great George-street, S.W.*
- 1865 Bernard, P. N., Esq. 37, *Connaught-square, W.*; and 8, *Fench-lane, F.C.*
- 1866 Berridge, F., Esq. *Winchester House, Winchester-road, Adelaide-road, N.W.*
- 1856 Perry, Josiah, Esq. 16, *Regent-square, W.C.*
- 1863 Best, William, Esq. 85, *Osford-terrace, Hyde-park, W.*
- 1842 \*Bethune, R.-Adm. C. R. Drinkwater, C.B. 4, *Cromwell-nd., South Kensington, W.*
- 1864 \*Betts, E. L., Esq. *Preston-hall, Murbstone, Kent.*
- 1836 Betts, John, Esq. 115, *Strand, W.C.*
- 1866 Bevan, William, Esq. 8, *Cedars-road, Clapham-common, S.*
- 1862 160 Bicker-Caarten, Peter, Esq. 30, *Northumberland-place, Bayswater, W.*
- 1866 Bicknell, Algernon S., Esq. 37, *Onslow-square, S.W.*
- 1860 Bidder, G. Parker, Esq., C.B. 24, *St. George-st., S.W.*; and *Mitcham, Surrey, S.*
- 1865 Bidwell, Charles Toll, Esq. *Garrieh Club, 35, Kensington, W.C.*; and 28, *Grosvenor-st., Eaton-sq., S.W. Care of John B. D. Esq., Foreign Office.*
- 1863 Bigg, Thos., Esq. *Crown-hill-house, Abbey-wood, Kent.*
- 1859 Bigge, Frederick W., Esq. *Union Club, S.W.*
- 1850 Bigsby, John J., Esq., M.D. 89, *Gloucester-place, Portman-square, W.*
- 1864 Bingham, P., Esq. *Athenaeum Club, S.W.*

Year of  
Election.

- 1858 Birch, Augustus F., Esq., M.A.
- 1860 Birch, H. W., Esq. 46, *Welbeck-street, Curendish-square, W.*
- 1858 170 Birch, John William, Esq. 9<sup>th</sup>, *New Broad-st., E.C.*; and 27, *Curendish-sq., W.*
- 1859 Birch, Capt. Thomas, R.N. *United Service Club, S.W.*
- 1862 \*Birchill, B. H. H., Esq. *St. Stephen's, Bedford, near Hounslow.*
- 1867 \*Bischoffheim, Henri Louis, Esq. 7, *Grafton-street, New Bond-street, W.*
- 1858 Bishop, George, Esq., F.R.A.S. *Union Club, S.W.*; and *The Meadows, Twickenham, S.W.*
- 1861 Bishop, James, Esq. 11, *Portland-place, W.*
- 1836 \*Blaauw, William H., Esq., M.A., F.S.A., F.Z.S. *Beccles, near Uckfield, Sussex.*
- 1860 \*Black, Francis, Esq. 6, *North-brook, Edinb'gh.*
- 1867 Black, Thomas, Esq., Superintendent P. and O. Steam Navigation Company's Docks. *Orkney and Liverpool.*
- 1858 Blackett, Henry, Esq. 13, *Great Marlborough-street, W.*
- 1849 180 Blackie, W. Graham, Esq., PH. DR. 36, *Friedrich-street, Glasgow.*
- 1861 \*Blackney, William, Esq., R.N. *Hydrographic Office, S.W.*
- 1862 \*Blackstone, Frederick Elliot, Esq., B.C.L. *British Museum, W.C.*
- 1854 Blaine, D. Robertson, Esq., Barrister-at-Law. 3, *Paper-buildings, Temple, E.C.* and 8, *Southwark-place, Hyde-park-square, W.*
- 1857 \*Blake, Wollaston, Esq. 8, *Deconshire-place, W.*
- 1859 Blakeley, Capt. Alexr., R.A. 34, *Montpelier-square, Rutland-gate, S.W.*
- 1857 Blackiston, Captain Thomas, R.A. 28, *Wellington-street, Woolwich, S.E.*
- 1830 \*Blanshard, Henry, Esq., F.R.A.S.
- 1861 \*Blanshard, Henry, Esq. 78, *Westminster-terrace, W.*; and 53, *Chancery-lane, W.C.*
- 1857 Blanshard, Richard, Esq. *Fairfield, Lynington, Hants.*
- 1865 190 Blaxall, Fras. H., Esq., M.D. *Tandring, near Colchester.*
- 1854 Blencowe, W. Robert, Esq. *The Hook, Leves.*
- 1861 Blenkin, William, Esq. *Ablestone, Surrey.*
- 1839 \*Blewitt, Octavian, Esq. 4, *Adelphi-terrace, Strand, W.C.*
- 1864 Blore, Edward, Esq., D.C.L., F.R.S., F.S.A., &c. 4, *Manchester-square, W.*
- 1866 Blow, William Wootton, Esq. 6, *Wynmore-street, Curendish-square, W.*
- 1861 Bloxsome, Oswald J., Esq. *Clarence-house, Dojnor, Sussex.*
- 1837 \*Blunt, Jos., Esq.
- 1863 \*Blunt, Wilfred, Esq.
- 1858 Bohn, Henry G., Esq. *Fork-st., Covent-garden, W.C.*; and *North-end-house, Twickenham, S.W.*
- 1863 200 Boileau, Sir John P., Bart., F.R.S. 20, *Upper Brook-street, W.*
- 1850 Bollaert, William, Esq. 21 A, *Hammer-square, W.*
- 1862 Bolton, Capt. Francis John, 12th Regt. *Chatham.*
- 1861 Bompas, George Cox, Esq. 15, *Stander-gardens, Kensington-park, W.*
- 1864 Bone, John William, Esq., B.A., F.R.S.L., F.S.S. 42, *Belford-square, W.C.*
- 1861 Bonney, Charles, Esq. *Adelaide, Australia.*
- 1858 Bonnor, George, Esq. 49, *Pull-mill, S.W.*; and 2, *Bayswater-terr., Kensington-square, W.*

Year of  
Election.

- 1865 Bonwick, James, Esq. *St. Kilda, Melbourne.*
- 1866 Booker, Wm. Lane, Esq. *Chil Service Club, S.W.*
- 1859 Borough, Sir Edward, Bart. 4, *Nassau-street, Dublin.*
- 1845 210\* Borier, Dawson, Esq. *Altmont Bolton, Co. Carlow, Ireland.*
- 1856 \*Butcherby, Blackett, Esq., M.A. 48, *Brompton-rose, S.W.*
- 1858 \*Butterill, John, Esq. *Flower-bank, Bailey-road, Leeds.*
- 1860 Boustead, John, Esq. 34, *Craven-street, Strand, W.C.*
- 1866 \*Boutcher, Emanuel, Esq. 12, *Oxford-square, Hyde-park, W.*
- 1865 Bouverie, P. P., Esq. 16, *Hill-street, Berkeley-square, W.*
- 1855 Boret, Charles, Esq. 135, *Camden-road, N.W.*
- 1861 \*Bowen, Charles Christopher, Esq. *Christchurch, Canterbury, New Zealand.*  
*One of A. O. Ottywell, Esq., 16, Charing-cross, S.W.*
- 1866 Bower, Anthony Maw, Esq. 8, *Rochester-road, Camden Town, N.W.*
- 1854 \*Bowen, Sir George Ferguson, K.C.M.G., M.A. *Governor of Queensland, Australia.*
- 1862 220 Bowie, John, Esq. *Conservative Club, S.W.*
- 1833 Bowles, Admiral Sir William, K.C.B. 8, *Hill-street, Berkeley-square, W.*
- 1856 Bowman, John, Esq. 9, *King William-street, E.C.*
- 1865 Bowring, John, Esq. *Law House, Etcetera.*
- 1866 Bowring, Samuel, Esq. 1, *Westbourne-park, W.*
- 1862 Boyce, Rev. W. B., Secretary to Wesleyan Missionary Society. 38, *Milner sq., Islington, N.; and Wesleyan Mission House, Bishopsgate-street, E.C.*
- 1845 \*Boyd, Edward Lennox, Esq., F.S.A. 35, *Chesham-square, Hyde-park, W.*
- 1865 Boyle, Frederick, Esq. *The Firs, Belmont, Cheshire.*
- 1856 Boyne, G. Hamilton-Russell, Viscount. 22, *Belgrave-square, S.W.; Brancepeth-castle, Durham; and Barnarton-hall, Ludlow, Salop.*
- 1851 Braconbridge, Charles Holte, Esq. *Atherstone, Warwick.*
- 1862 230 Branthwaite, Isaac, Esq. 68, *Old Broad-street, E.C.*
- 1863 \*Bramley-Moore, John, Esq. *Lough-foyle, Gerard's Cross, Bucks.*
- 1859 \*Brand, James, Esq. 109, *Fenchurch-street, E.C.*
- 1860 Brassey, T., Esq. 4, *Great George-street, S.W.; and 56, Lombes-square, S.W.*
- 1859 Braybrooke, Philip Wat-on. *Assistant Colonial Secretary, Ceylon. Messrs. Price and Co., Craven-street.*
- 1861 \*Brenchley, Julius, Esq. *Oxford and Cambridge Club, S.W.; and Milgate, near Maidstone, Kent.*
- 1846 Breton, Rev. C. D., M.A. *Little Massingham, Roughton, Norfolk.*
- 1833 \*Breton, Rev. John, LL.D., F.S.A. *Bedford.*
- 1864 \*Breton, Wm. Henry, Esq., Comm. R.N., M.R.I. 15, *Camden-crescent, Bath.*
- 1862 Brett, Charles, Esq. 44, *Chesham-square, W.*
- 1858 240 Bridges, Nathaniel, Esq.
- 1852 \*Briely, Oswald W., Esq. 8, *Liddington-pl., Harrington-sq., Hampstead-rd., N.W.*
- 1865 Briggs, Major, J. P. *Linthill, Lillesleaf, Selkirk, N.B.*
- 1861 \*Bright, Sir Charles T., M.P., F.R.A.S. 1, *Victoria-street, Westminster, W.; and 69, Lancaster-gate, W.*
- 1860 Bright, James, Esq., M.D. 12, *Wellington-square, Cheltenham.*



Year of  
Election.

- 1854 Brine, Major Frederic, R.E. *Army and Navy Club, S.W.; Bengal, E. Indies.*  
‘*Proc.*’ to Mrs. F. Brine, *Edgumbe, Torquay.*
- 1856 Brine, Commander Lindesay, R.N. *Army and Navy Club, S.W.; H.M.S.*  
‘*Racer, Mediterranean.*’
- 1861 Bri-towe, Henry Fox, Esq.
- 1861 Broadwater, Robert, Esq. 3, *Dilliter-square, Fenchurch-street, E.C.*
- 1864 Brodie, G. S., Esq. 27, *Penbridge-square, W.*
- 1861 250 Brodie, Walter, Esq. 13, *Delamere-terrace, Hyde-park, W.*
- 1861 Brodie, William, Esq. *Lustbourne, Sussex.*
- 1863 \*Brodrick, George C., Esq. 32A, *Mount-street, W.*
- 1838 Brooke, Sir James, K.C.B., D.C.L. *Barrister, Horsham-bridge, S. Devon; Athenæum*  
*Club, S.W.; and Strand, E.C.*
- 1864 \*Brooke, Sir Victor A., Bnt. *Col Brooke-park, Co. Fermanagh, Ireland.*
- 1862 Brookes, Thomas, Esq. *Mutton-line, Ealing, W.*
- 1856 \*Brooking, George Thomas, Esq. 25, *Sussex-gardens, Hyde-park, W.*
- 1856 \*Brooking, Marmaduke Hart, Esq. 11, *Montagu-place, Brynston-square, W.*
- 1863 \*Brooking, Thomas Holdsworth, Esq. 15, *New Broad-street, City, E.C.; and*  
5, *Norfolk-crescent, Hyde-park, W.*
- 1863 Brophy, C. A., Esq. *Sidmouth.*
- 1863 260 \*Broughall, William, Esq. *Broadwater, Down, Tunbridge-Wells.*
- 1850 Broughton, John, Lord, G.C.B., M.A., F.R.S. 42, *Berkeley-square, W.; and*  
\* *Erlestoke-park, Westbury, Wilts.*
- 1859 Broughton, L. P. Delves, Esq. 73, *Pelgrave-road, S.W.*
- 1856 \*Brown, Daniel, Esq. *The Elms, Lorkhall-rise, Clapham, S.*
- 1864 Brown, Edwin, Esq., F.G.S. *Barton-on-Trent.*
- 1867 Brown, Geo. H. Wilson, Esq. *Victoria, Vancouver Island, British Columbia.*  
*Care of H. C. Beeton, Esq., 5, Borchard-street, E.C.*
- 1860 Brown, James, Esq., M.P. *Rossington, Yorkshire.*
- 1863 Brown, Jas. P., Esq. *Ab Janeiro. Care of Mr. Chas. Williams, 25, Poultry,*  
*E.C.*
- 1865 \*Brown, James R., Esq., F.R.S.N.A. Copenhagen. *The Laurels, The Haven,*  
*Ealing; and 5, Lougham-chambers, Lougham-place, W.*
- 1861 \*Brown, John Allen, Esq. 3, *Newcastle-place, Clerkenwell, E.C.; and Scaleby-*  
*lodge, Camden-road, N.*
- 1867 270 Brown, Robert, Esq. 4, *Gladstone-terrace, Hope-park, Edinburgh.*
- 1856 \*Brown, Samuel, Esq. 11, *Lombard-st., E.C.; and The Elms, Lorkhall-rise,*  
*Clapham, S.*
- 1858 \*Brown, Thomas, Esq. 8, *Hyde-park-terrace, Hyde-park, W.*
- 1839 Brown, William, Esq. *Loat’s-road, Clapham-park, S.*
- 1863 Browne, H. H., Esq. 70, *Weston-upon-avon-rills, Harrow-rd., Paddington, W.*
- 1862 Browne, John Comber, Superintendent and Inspector of Government Schools.  
*Port Louis, Mauritius.*
- 1858 Browne, John H., Esq. *Port Georger, S. Australia.*
- 1864 \*Browne, Capt. Wade. 6, *Charles-street, Berkeley-square, W.*
- 1858 Browne, William J., Esq. *Port Georger, S. Australia.*

Year of  
Election.

- 1852 Browning, Henry, Esq. 72, *Grosvenor-street, W.*; and *Anpton-hall, Bury St. Edmunds.*
- 1856 280 \*Browning, Thomas, Esq. 6, *Whitehall, S.W.*
- 1859 Bruce, Henry Austin, Esq., M.P. *Duffryn, Aberdure, Glamorganshire.*
- 1863 Brunton, John, Esq., M.I.C.E., F.R.S. *Care of Messrs. Hunter and Groatkin, 9, New-square, Lincoln's Inn, W.C.*
- 1856 Bryant, Walter, Esq., M.D., F.R.C.S. 7, *Bithurst-street, Hyde-park-jardens, W.*
- 1843 \*Buchan, John Hitchcock, Esq. *The Grove, Hamwell, W.*
- 1863 Buchanan, Walter, Esq., M.D.
- 1859 Buckland, Edward C., Esq. 36, *Lansdowne-road, Notting-hill, W.*
- 1863 Buckl, J. Palmer, Esq. *The Langhorn Hotel, W.*; and *Ynysydoren, near Swansea.*
- 1865 Buller, Sir Edward M., Bart., M.P. *Old Palace-yard, S.W.*; and *Dilhora-hall, Chesham, Bucks.*
- 1867 \*Bulger, Capt. George Ernest, F.R.S., &c. *Care of Mr. Booth, 307, Regent-st., W.*
- 1863 290 Bullock, Commander Charles J., R.N. *Hydrographic Office, S.W.*
- 1830 \*Bullock, Rear-Admiral Frederick. *Woolwich, S.E.*
- 1864 Bullock, W. H., Esq. *Grosvenor-hill, Wimbledon, S.W.*
- 1860 \*Bunbury, Sir Charles James Fox, Bart.; F.R.S. *Borton-hall, Bury St. Edmunds.*
- 1839 Bunbury, E. H., Esq., M.A. 35, *St. James's-street, S.W.*
- 1863 Bunlock, F., Esq. *Wimbledon Club, S.W.*; and 4, *Rodnor-pl., Gloucester-sq., W.*
- 1861 Burges, William, Esq. *Edith, Co. Tipperary.*
- 1866 Burgess, James, Esq., M.R.A.S., Principal of Sir J. Jejeebhoy's Parsee B. Institution. *Honabji-rov, Bombay.*
- 1863 Burgoyne, Capt. Hugh Talbot R.N., V.C. 8, *Gloucester-gardens, Hyde-park, W.*
- 1864 Burn, Robert, Esq. 3, *Clifton-place, Sussex-square, W.*
- 1863 300 \*Burns, John, Esq. 1, *Park-jardens, Glasgow*; and *Castle Wemyss, by Greenock, N.B.*
- 1861 \*Burr, Higford, Esq. 23, *Eaton-place, S.W.*; and *Aldermaston-court, Berkshire.*
- 1857 Burstal, Capt. E., R.N. 6, *Park-villas, Lower Norwood, S.*
- 1830 \*Burton, Alfiel, Esq. 36, *Moravia, St. Leonard's.*
- 1833 \*Burton, Decimus, Esq., F.R.S. 14, *Spring-jardens, S.W.*; and *St. Leonard's-cottage, Hastings.*
- 1859 \*Burton, Capt. Richd. Fras., 18th Regt. Bombay N.I., H.B.M. Consul at Santos, Brazil. 14, *St. James's-sq., S.W.* *Care of R. Arncliffe, Esq., Admiralty, Somerset House, W.C.*
- 1847 Burton, S. S., Esq.
- 1858 Bury, William Coutts, Viscount, M.P. 48, *Rotham-gate, S.W.*
- 1861 Bush, Rev. Robert Wheeler, M.A. 1 *Milner-square, Islington, N.*
- 1861 Butler, Charles, Esq. 13, *Sussex-square, W.*
- 1859 310 Butler, Edward, Esq. *Lansdowne-road, Hyde-park, W.*
- 1867 Butler, L. Dundas, Esq. *Geographical Department, British Museum, W.C.*
- 1867 \*Butler, Rev. Pierce Rector of Ulcombe). *Ucombe Rectory, Staplehurst, Kent.*
- 1860 \*Butler, Rev. Thomas. *Rector of Lampyr, Nottinghamshire.*

Year of Election	
1862	*Buxton, Chas., Esq., M.P. 7, <i>Grosvenor-crescent, S.W.</i> ; and <i>Fox-warren, Surrey.</i>
1859	*Buxton, Sir Thomas Fowell, Bart., M.P. <i>Brick-lane, N.E.</i>
1866	Byass, Robert B., Esq. <i>Melville-park, Tunbridge Wells.</i>
1864	Bythesen, Capt. J., R.N., V.C. 20, <i>Grosvenor-place, Bath.</i> Care of T. G. Staveley, Esq., <i>Foreign-office, S.W.</i>
1830	*Cabbell, B. B., Esq., M.A., F.R.S., F.S.A. 1, <i>Brick-court, Temple, E.C.</i> ; 52, <i>Portland-place, W.</i> ; and <i>Aldwick, Sussex.</i>
1866	Caldbeck, Capt. J. B. (P. and O. Sup. at Aden). 17, <i>West Mall, Clifton</i> , and 122, <i>Leadenhall-street, E.C.</i>
1857	320 *Caldwell, Capt. Henry, R.N. <i>H.M.S. 'Mersey,' Portsmouth</i> ; and 3, <i>Audley-square, W.</i>
1863	Callaghan, Thos. F., Esq.
1863	Calthorpe, Lord. 33, <i>Grosvenor-square, W.</i>
1861	Calthorpe, the Hon. Augustus Gough. 33, <i>Grosvenor-square, W.</i>
1855	*Calthorpe, the Hon. F. H. Gough, M.P. 33, <i>Grosvenor-square, W.</i>
1859	Calvert, Edmund, Esq. <i>British Embassy, Constantinople.</i>
1854	Calvert, Frederic, Esq., Q.C. 5, <i>Tulley-street, Park-lane, W.</i> ; and 8, <i>New square, Lincoln's-inn, W.C.</i>
1858	Cameron, Capt. Charles D. Care of E. Hertslet, Esq., <i>Foreign-office, S.W.</i>
1861	Cameron, Donald, Esq. <i>Anchacorey, Invernesshire.</i>
1864	Cameron, J., Esq. <i>Surveyor. Care of Messrs. Smith, Elder, and Co.</i>
1858	330 Cameron, Major-General Duncan Alexander, R.F. C.B. <i>New Zealand.</i>
1866	Cameron, R. W., Esq. <i>Statua Island, New York.</i> Care of Messrs. Brooks and Co., <i>St. Peter's Chambers, Cornhill, E.C.</i>
1861	Campbell, Capt. Frederick, R.N. 12, <i>Connaught-place, Hyde-park, W.</i>
1861	Campbell, James, Esq. 158, <i>Regent-street, W.</i> ; and <i>Thornton Steward, York.</i>
1844	*Campbell, James, Esq. <i>Grove-house, Hendon, Middlesex</i> ; and 8, <i>Park-street, Grosvenor-square, W.</i>
1857	Campbell, James, Esq., Surgeon R.N. <i>Bangkok, Siam.</i> Care of Messrs. Smith, Elder, and Co.
1834	*Campbell, James, Esq., jun. <i>Hampton-court-green, S.W.</i>
1863	Campbell, Jas. Duncan, Esq.
1866	Campbell, the Hon. George, Judge of the Supreme Court, <i>Calcutta.</i>
1857	Camps, William, Esq., M.D. 40, <i>Park-street, Grosvenor-square, W.</i>
1866	340 Canning, Sir Samuel, C.B. 12, <i>Sussex-terrace, Hyde-park, W.</i>
1857	Cannon, Lieut.-General P.
1864	Cannon, John Wm., Esq. <i>Costle-grove, Tuam.</i>
1853	*Cardwell, Right Hon. Edward, M.P. 74, <i>Eaton-square, S.W.</i>
1863	*Carew, R. Russell, Esq., J.P. <i>Carpenter's-park, Watford, Herts</i> ; and <i>Oriental Club, W.</i>
1862	Cargill, John, Esq., Member of the Legislative Assembly of New Zealand and Legislative Council of Otago. <i>Dunedin, Otago, New Zealand.</i>
1863	*Cargill, Wm. W., Esq. 4, <i>Connaught-place, Hyde-park, W.</i>

Year of  
Election.

- 1864 \*Carmichael, L. M., Esq., M.A., 5th Lancers, *Canterbury. Care of H. T. Clerk, Esq., 50, Leicester-square, W.*
- 1865 \*Carnegie, David, Esq. *Eastbury, by Watford, Herts.*
- 1863 Carnegie, Adml., the Hon. J., R.N. *H.M.S. 'Subunander.'*
- 1864 350 Carrington, R. C., Esq. *Admiralty, S.W.*
- 1861 Carter, Captain Hugh Bonham, Coldstream Guards. *Guards' Club, S.W.; and 1, Curliole-place, Victoria-street, S.W.*
- 1860 Cartwright, Capt. Henry, F.R.S. *Barbican-lodge, Gloucester.*
- 1857 Cartwright, Col. Henry, Grenadier Guards, M.P. 1, *Tilney-street, Park-street, Grosvenor-square, W.*
- 1860 \*Carver, the Rev. Alfred J., D.D., Master of Dulwich College. *Dulwich, S.*
- 1858 Casella, Louis P., Esq. 23, *Hatton-jardin, E.C.; and South-grove, Highgate, N.*
- 1860 Cave, Amos, Esq. 109, *Nov-road, Kennington-park, S.; and Rothbone-place, Oxford-street, W.*
- 1857 Cave, Capt. Laurence Trent. 23, *Lowndes-street, Belgrave-square, S.W.*
- 1858 Cive, Stephen, Esq., M.P. 35, *Wilton-place, S.W.*
- 1863 Challs, John Henry, Esq. *Reform Club, S.W.*
- 1865 360 Chambers, Charles Haucourt, Esq., M.A. 2, *Chesham-place, S.W.*
- 1864 Chambers, David, Esq. *Paternoster-row, E.C.*
- 1865 Chambers, Wm. Thomas Hodgetts, Esq. *Chichester, Sussex; and 5, Osborne-villas, Stoke, Devonport.*
- 1866 Chambers, Lieut.-Col. John (J.P., Lancashire). *Priory House, Exeter, near Liverpool; and Portobello-house, Mortlake, Surrey.*
- 1858 Champion, John Francis, Esq. *High-street, Sharnbury.*
- 1866 \*Chandless, Wm., Esq., B.A. 1, *Gloucester-place, Portman-square, W.*
- 1863 \*Chapman, Spencer, Esq. *Rochington, S.W.*
- 1860 Charlemont, Lord. *Charlemont-house, Dublin.*
- 1861 Charnock, Richard Stephen, Esq., Ph.D., F.R.S. 8, *Gray's-inn-square, W.C.; and The Grove, Hammersmith.*
- 1864 Cheadle, Walter, Esq., B.A., M.P. Camb. 9, *Hyle-park-place, Cumberland-gate, W.*
- 1861 370 Cheetham, John Frohlock, Esq. *Eastwood, Stalybridge.*
- 1855 Cheshire, Edward, Esq. *Conservative Club, S.W.*
- 1838 \*Chesney, Major-General Francis Rawdon. R.A., D.C.L., F.R.S. *Athenæum Club, S.W.; and Ballyvalle, Down, Ireland.*
- 1853 Chetwode, Augustus L., Esq. 7, *St. John's-street, Pall-mall-east, S.W.; and Chilton-house, Thame, Oxfordshire.*
- 1853 Childers, Hugh C. E., Esq., M.P. 17, *Prince's-gardens, W.; and Australia.*
- 1856 Childers, John Walbanke, Esq. *Cantley-hall, near Doncaster.*
- 1857 \*Chinmo, Commr. William, R.N. *Hydrographic-office, S.W.*
- 1861 Christian, Capt. Henry, R.N.
- 1854 \*Church, J. W., Esq., B.A. *United University Club, S.W.; and Woodside, Hotspur.*
- 1830 \*Church, W. H., Esq.
- 1849 380 Churchill, Lord Alfred Spencer. 16, *Rutland-gate, S.W.*
- 1856 Churchill, Charles, Esq. *Weybridge-park, Surrey.*

Year of  
Election.

- 1853 Clarendon, George William, Earl of, K.G., G.C.B. 1, *Grosvenor-crescent, S.W.*  
*The Grove, Watford, Herts; and Hindon, Wilts.*
- 1863 Clark, Lieut. Alex. J. 14, *St. James's Square, S.W.; and Eveswell-house,*  
*Mindoe, Newport, Monmouthshire.*
- 1852 Clark, Daniel, Esq. *Care of F. L. Price, Esq., 3, Barnard's-inn, Holborn, E.C.*
- 1840 \*Clark, Sir James, Bart., M.D., F.R.S. *Bagshot-park, Surrey.*
- 1862 Clark, Latimer, Esq. 1, *Victoria-street, Westminster, S.W.; and Cairo.*
- 1865 Clark, W. H., Esq. 6, *Leinster-terrace, Hyde-park, W.*
- 1859 Clarke, Capt. A., R.F. *Army and Navy Club, S.W.*
- 1860 Clarke, Rev. Joseph W., D.D., Chaplain R.N. *H.M.S. 'Arethusa.' Care of*  
*Rev. J. Clarke, Ballymashuff, Co. Cavan, Ireland.*
- 1855 395 \*Clarke, Rev. W. B., M.A. *St. Leonard's, Sydney, New South Wales. Messrs.*  
*Richardson, Cornhill.*
- 1859 Clarke, Rev. W. Geo., M.A. *Trinity College, Cambridge.*
- 1862 Claude, Eugène, Esq. 22, *Park-road, Holloway, N.*
- 1842 \*Clavering, Sir William Aloysius, Bart., M.A. *United University Club, S.W.;*  
*Axwell-park, near Gateshead; and Greencroft, Durham.*
- 1863 Clay, Sir Wm., Bart. *Eaton-square, S.W.*
- 1863 Clayton, Capt. John W., late 15th Hussars. 14, *Portman-square, W.*
- 1866 Clayton, Sir W. R. *Hulleyford, Great Marlow, Bucks.*
- 1866 \*Cleghorn, Hugh, Esq., M.D., Conservator of Forests. *Madras.*
- 1863 Clements, Rev. H. G. *United University Club, S.W.*
- 1860 Clerk, Capt. Claude. *Mediterranean Prison (Queen's Bench), Southwark, S.*
- 1830 400 \*Clerk, Rt. Hon. Sir George, Bart., D.C.L., F.R.S., &c. *Pennicuik-house, Edinburgh.*
- 1858 Clemond, Thomas, Lord. *Rensselaire-park, Newry, Ireland.*
- 1845 \*Cleveland, His Grace the Duke of. 1, *Grosvenor-place-houses, S.W.*
- 1861 Clifford, Sir Charles. *Coldham-hall, Suffolk.*
- 1858 Clifford, Charles Cavendish, Esq. *House of Lords, S.W.*
- 1856 Clive, Rev. Archer. *Whitefield, Hereford.*
- 1863 Clowes, E., Esq. *Salisbury-square, Fleet-street, E.C.*
- 1854 Clowes, George, Esq. *Charing-cross, S.W.; Duke-street, Stamford-street,*  
*Blackfriars, S.; and Subitton, Surrey.*
- 1864 Clowes, Rev. George, B.A. *Subitton, Surrey.*
- 1854 Clowes, William, Esq. 51, *Gloucester-ter., Hyde-park, W.; and Charing-cross.*
- 1861 410 Clowes, William Charles Knight, Esq., M.A. *Duke-street, Stamford-street,*  
*Blackfriars, S.; and Subitton, Surrey.*
- 1852 Cobbold, John Chevalier, Esq., M.P. *Athenaeum Club, S.W.; and Ipswich, Suffolk.*
- 1859 Cochrane, Capt. the Hon. A., R.N., C.B. *Junior United Service Club, S.W.*
- 1862 Cockerton, Richard, Esq. 12, *Petersham-terrace, South Kensington, W.*
- 1862 \*Cockle, George, Esq. 77, *Oakley-square, S.W.*
- 1865 Cocks, Major Octavius Yorke. 180, *Portland-pk, W.*
- 1859 Cocks, Colonel C. Lygon, Coldstream Guards. *Trevelyan-Vean, near Liskeard.*
- 1841 \*Cocks, Reginald Thistlethwayte, Esq. 43, *Charing-cross, S.W.; and*  
*22, Bedford-street, May-fair, W.*
- 1857 Coghlan, Edward, Esq. *Training Institution, Gray's-inn-road, W.C.*

Year of  
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- 1862 Coghlan, Major Gen. Sir William M., K.C.B., R.A. *Ramsgate, Kent.*
- 1861 420 Coghlan, J., Esq., Engr.-in-Chief to the Government. *Buenos Ayres. Care of Messrs. J. Fair and Co., 4, East India Avenue, Leadenhall-street, L.C.*
- 1838 Colchester, Charles, Lord, Rear-Admiral, D.C.L. 34, *Berkeley-square, W. and Kidbrooke, Sussex.*
- 1841 \*Colebrooke, Sir Thomas Edward, Bart., M.P., F.R.A.S. 37, *South-st., Park-lane, W.*
- 1834 Colebrooke, Lt.-General Sir Wm., R.A., M.G., C.B., K.H., F.R.A.S. *Dutchet. near Windsor; and United Service Club, S.W.*
- 1854 Coleman, Everard Home, Esq., F.R.A.S. *Registry and Record Office, Abchurch-lane, London-bridge, E.C.*
- 1848 Coles, Charles, jun., Esq. 86, *Great Tower-street, E.C.*
- 1835 \*Collett, William Rickford, Esq.
- 1858 Collinson, Henry, Esq. 7, *Cedars-road, Clapham-common, S.*
- 1866 Collinson, John, Esq., C.R. 9, *Clarendon-gardens, Maid-chill, W.*
- 1855 Collinson, Rear-Admiral Richard, C.B. *Haven-lodge, Ealing, W.; and United Service Club, S.W.*
- 1866 430 Collison, Francis, Esq. *Heron-hall, Surrey, S.*
- 1864 Colnaghi, Dominic L., Esq. *Care of F. B. Alston, Esq., Foreign Office, S.W.*
- 1862 Colquhoun, Sir Patrick, M.A.
- 1866 Colquhoun, Sir Robert G., K.C.B. 6, *Ulster-terrace, Regent's-park, N.W.; and 14, Arlington-street, W.*
- 1861 \*Colville, Charles John, Lord. 42, *Eaton-place, S.W.*
- 1865 Colvin, Bunney J., Esq. 26, *Oxford-square, Hyde-park, W.*
- 1861 Combe, Thomas, Esq., M.A. *University Press, Oxford.*
- 1864 Commerell, Commr. J. E., R.N., V.C. *Atherbank, near Gosport.*
- 1864 Conder, John, Esq. *Hillbrook-house, New Wandsworth, N.W.*
- 1861 Constable, Capt. Chas. Golding, L.N. 68, *Hamilton-ter., St. John's-road, N.W.*
- 1843 440 \*Cook, James, Esq. 40, *Mincing-lane, E.C.; and 47, Portland-place, W.*
- 1859 Cooke, Major A. C., R.E. *Topographical Department, 4, New-street, Spring-gardens, S.W.*
- 1863 \*Cooke, E. W., Esq., A.R.A., F.R.S., F.L.S., F.G.S. *The Ferns, Kinsington, W.*
- 1856 Cooke, John George, Esq. 47, *Mount-street, Berkeley-square, W.*
- 1860 Cooke, Nathaniel, Esq. 5, *Ladbroke-terrace, Notting-hill, W.*
- 1866 Cooke, Rev. J. Hunt. *Airedale-villa, Elm-grove, Southsea, Hants.*
- 1852 Cooke, Robt. F., Esq. 50, *Athenarke-street, W.*
- 1860 Cooke, William Henry, Esq., Barrister-at-Law. 4, *Elm-court, Temple, E.C.*
- 1860 Cooley, William Desborough, Esq. 136, *Culston-road, Kentish-town, N.W.*
- 1862 Cooper, Sir Daniel. 20, *Prince's-gate, S.W.*
- 1856 450 Cooper, Lt.-Col. Edward, Grenadier Guards. 5, *Brunston-square, W.*
- 1860 Cooper, Lt.-Col. Joshua H., 7th Fusiliers. *Gibraltar.*
- 1853 Coote, Charles Chidley, Esq. C4, *Albury, W.; and Mount-Coote, Limerick, Ireland.*
- 1857 \*Coote, Captain Robert, R.N. *Shales, Bittern, Southampton.*
- 1862 Cope, Walter, late H.M.'s Chargé d'Affaires at the Equador. 14, *The Terrace, Camberwell, S.*

Year of  
Election.

- 1853 Copley, Sir Joseph William, Bart. *Sprotborough, Doncaster.*  
 1864 Cork and Onnery, Earl of. 1, *Grafton-street, W.*  
 1865 Cornthwaite, Rev. T., M.A. *Forest, Wulhamstove.*  
 1860 Cornwell, James, Esq., PH. DR. *Longborough-park-villa, Briston, S.*  
 1839 \*Corrance, Frederick, Esq. *Parkham-hill, Wickham Market, Suffolk.*  
 1856 460 Costerton, John C., Esq. *Canton.*  
 1853 \*Cosway, William Halliday, Esq. *Oxford and Cambridge Club, S.W.*  
 1863 Courtenay, L. W., Esq. *British Post-office, Constantinople. Cure of R. Wood, Esq., 139, Fleet-street.*  
 1865 Cowan, John L., Esq. 59, *Prince's-square, Hyde-park, W.*  
 1862 Coward, William, Esq. 5, *Park-villas, Lower Norwood, S.*  
 1857 \*Cowell, Major Sir J. C., K.C.B., R.E. *Buckingham-palace, S.W.*  
 1861 Cowell, John Jermyn, Esq. 41, *Gloucester-terrace, Hyde-park, W.*  
 1854 Cowley, Norman, Esq. 4, *Montagu-place, Montagu-square, W.*  
 1862 Cowper, Sedgwick S., Esq. *Messrs. J. Clinch and Son, Abchurch-lane, E.C.*  
 1862 Cox, Edward William, Esq., Barrister-at-Law, Recorder of Falmouth. 1, *Essex-court, Temple, E.C.; and Mount-mont, Highwood, Middleser.*  
 1865 470 Coysh, John S., Esq. *Levant-house, St. Helen's-place, E.C.*  
 1867 Crane, Leonard, Esq., M.D. 7, *Albemarle-street, W.*  
 1857 Craufurd, Major-General James Robertson, Grenadier Guards. *Travellers' Club, S.W.; and 36, Prince's-gardens, W.*  
 1848 Crawford, Robert Wigram, Esq., M.P. 71, *Old Broad-street, E.C.*  
 1830 Crawford, John, Esq., F.R.S. *Athenaeum Club, S.W.; and 4, Leicester-place, Queen's-gate, S.W.*  
 1866 Crawford, O. J., Esq. *Athenaeum Club, S.W.*  
 1861 Creswell, Rev. S. F., M.A. *The Grammar School, Dartford, North Kent.*  
 1854 \*Creswell, Captain S. Gurney, R.N. *Lynn, Norfolk.*  
 1859 \*Creyke, Capt. Richard Boynton, R.N. *Ulverstone, Lancashire.*  
 1856 Croker, T. F. Dillon, Esq. 19, *Pelham-place, Brompton, S.W.*  
 1864 480 Croll, A. A., Esq., C.E. *Southwood, Southwood-lane, Highgate.*  
 1860 \*Crokey, J. Rodney, Esq. 84, *King William-street, E.C.; and Forest-house, High Beech, Essex.*  
 1860 Crosse, the Rev. Thomas, D.C.L., M.R.A.S. *Hastings.*  
 1862 Crossman, James Hicutt, Esq. 24, *Norfolk-crescent, Hyde-park, W.*  
 1863 \*Crowder, Thos. Mosley, Esq., M.A. *Thornton-hall, Eridge, Yorkshire.*  
 1859 Cull, Richard, Esq., F.S.A. 13, *Tavistock-street, Bedford-square, W.C.*  
 1857 Cumming, William Fullarton, Esq., M.D. *Athenaeum Club, S.W.; and Athol-crescent, Edinburgh.*  
 1847 \*Cunard, Sir Edward, Bart. *Care of Messrs. D. and C. MacIver, Liverpool.*  
 1860 Cunliffe, Roger, Esq. 24, *Lombard-street, E.C.; and 10, Queen's-gate, South Kensington, W.*  
 1864 Cunningham, H. Esq. *Cromen-hill, W.*  
 1853 490 Cunningham, John Wm., Esq., Sec. King's College. *Somerset-house, W.C.; and Harrow, N.W.*

Year of  
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- 1862 \*Cunynghame, Major-Gen. A. T., C.B. *Commanding Dublin Division, Royal Barracks, Dublin.*
- 1865 Cure, Capel, Esq. 51, *Grosvenor-street, W.*
- 1843 \*Cursetjee, Manockjee, Esq., F.R.S.N.A. *Villa-Byculla, Bombay.*
- 1839 \*Curtis, Timothy, Esq.
- 1865 Curzon, Hon. R. 24, *Arlington-street, W.; and Parkum-park, Steyning, Sussex.*
- 1864 Dallas, A. G., Esq. 36, *Beaufort-gardens, W.*
- 1863 \*Dalgety, Fred. G., Esq. 8, *Hyde-park-terrace, W.*
- 1865 D'Almeida, W. B., Esq. 19, *Green-park, Bath.*
- 1863 Dalrymple, Donald, Esq. *Norwich.*
- 1857 500 Dalton, D. Foster Grant, Esq. *Shanks-house, near Wincanton, Somerset.*
- 1859 Dalryell, Sir Robt. Alex. Osborn, Bart. *H.M.'s Consul at Jussy; and Royal Hospital, Greenwich, S.E.*
- 1866 Damer, Lt.-Col. Lionel S. Dawson. 2, *Chapel-street, Grosvenor-square, W.*
- 1862 Darvall, John Bayly, Esq.
- 1838 \*Darwin, Charles, Esq., M.A., F.R.S. 6, *Queen Anne-street, Cavendish-square, W.*
- 1860 Dasent, John Bury, Esq. 22, *Warwick-road, Maida-hill, W.*
- 1863 Davies, R. H., Esq.
- 1865 \*Davis, Alfred, Esq. *Norfolk-hotel, Norfolk-square, Hyde-park, W.*
- 1858 Davis, Dr. Francis William, Surgeon R.N. *H.M.S. 'Alert'; and Ebn-lojje, St. Ann's-hill, Windsor, S.W.*
- 1866 Davis, Edmund F., Esq. *Twistock-house, Twistock-square, W.C.*
- 1866 510 Davis, Frederick E., Esq. 20, *Blondford-square, N.W.*
- 1861 Davis, Staff-Commander John Edward, R.N. *Hydrographic-office, Admiralty, S.W.*
- 1846 Davis, Sir John Francis, Bart., K.C.B., F.R.S., F.R.S.N.A. *Athenaeum Club, S.W.; and Hollywood, near Bristol.*
- 1840 \*Dawnay, the Hon. Payan. *Denningborough-hall, Newton-upon-Ouse, Yorkshire.*
- 1865 Debary, Rev. Thomas, M.A. 35, *Mount-street, W.*
- 1866 Debenham, William, Esq. 3, *Portchester-square, Hyde-park, W.*
- 1859 De Blaquiére, John, Lord. 9, *Stratford-place, W.*
- 1858 De Bougho, T. J., Esq. 6, *Charing-cross, S.W.*
- 1856 De Crespigny, Lieut. C., R.N.
- 1856 De Gex, William Francis, Esq. 25, *Thromorton-street, E.C.*
- 1853 520 De Grey and Ripon, George Frederick Samuel, Earl. 1, *Curlton-gardens, S.W.; and Stalley Royal, Ripon.*
- 1865 De Laski, A., Esq.
- 1862 Denham, Capt. Henry Mangles, R.N., C.B. 16, *Delmere-terrace, W.*
- 1860 Denison, Alfred, Esq. 6, *Albemarle-street, W.*
- 1834 \*Denison, Sir William Thomas, K.C.B., Lieut.-Col. R.E., F.R.S. *East Brent, Weston-super-Mare, Somerset.*
- 1836 Denman, Rear-Admiral the Hon. Joseph. *Commander-in-Chief, Pacific; and 17, Eaton-terrace, S.W.*



Year of Election.	
1833	*Derby, Edward Geoffrey, Earl of, P.C., F.L.S. 23, <i>St. James's-square, S. W.; and Knousley-park, Prescott, Lancashire.</i>
1854	*Devaux, Alexander, Esq. 2, <i>Avenue-road, Regent's-park, N. W.</i>
1837	*Devonshire, William Cavendish, Duke of, LL.D., D.C.L., M.A., F.R.S. <i>Devonshire-house, Piccadilly, W.; and Hardwicke-hall, Derbyshire.</i>
1865	Dew, Capt. Roderick, C.B., R.A. <i>Army and Navy Club, S.W.; and St. James's-street, S. W.</i>
1864	530 Dick, A. H. Esq., M.A., <i>Roseland-house, Partrick, near Glasgow.</i>
1862	Dick, Capt. Charles Diamond. <i>Exeter, Devon.</i>
1866	Dick, Fitzwilliam, Esq., M.P. 20, <i>Curzon-street, Mayfair, W.</i>
1861	Dick, Robert Kerr, Esq., Bengal Civil Service. <i>Oriental Club, W.</i>
1866	Dick, William Grame, Esq. 29, <i>Lincoln-square, W.</i>
1854	*Dickenson, Sebastian Stewart, Esq., Barrister-at-Law. <i>Brown's-hill, Stroud, Gloucestershire.</i>
1833	Dickinson, John, Esq., F.R.S., F.S.A. 39, <i>Upper Brook-street, W.; and Abbott's-hill, Hemel-Hempstead.</i>
1852	Dickinson, John, Esq., jun. <i>Clarence-chambers, 12, Haymarket, S. W.; and Abbott's-hill, Hemel-Hempstead.</i>
1830	*Dickinson, Francis Henry, Esq., F.S.A. 8, <i>Upper Harley-street, W.; and Kingston-park, Somerset.</i>
1860	Dickinson, Jas. Austen, Esq. <i>County Surveyor's Office, Mullingar.</i>
1859	540 Dickson, A. Benson, Esq. <i>Chapel-stairs, Lincoln's-inn, W.C.</i>
1858	Dickson, Charles Hammer, Esq. <i>H.B.M. Consul, Sultan Kule, Black Sea. Care of J. Murray, Esq., Foreign Office, S. W.</i>
1860	Dickson, Lieut.-Col. Lothian Sheffield. 10, <i>Stanhope-terrace, Hyde-park, W.</i>
1843	Dickson, Peter, Esq. 28, <i>Upper Brook-street, W.</i>
1860	Dietz, Bernard, Esq., of Algoa Bay. 3, <i>Dorset-square, W.</i>
1859	Digby, G. Wingfield, Esq. <i>Sheborne-castle, Dorset.</i>
1860	Digby, Lieut.-Col. John Almerus. <i>Chalnington-house, Cattstock, Dorchester.</i>
1845	*Dilke, Sir Charles Wentworth, Bart., M.P. 76, <i>Sloane-street, S. W.</i>
1859	*Dilke, Charles Wentworth, Esq. 76, <i>Sloane-street, S. W.</i>
1856	Dillon, the Hon. Arthur. 17, <i>Clorges-street, W.</i>
1864	550 Dimsdale, J. C., Esq. 50, <i>Cornhill, E.C.; and 52, Cleveland-square, S. W.</i>
1861	Dixon, Lieut.-Colonel John. 10, <i>Seymour-street, Portman-square.</i>
1854	Dixon, W. Hepworth, Esq., F.S.A. <i>Essex-villa, Queen's-road, St. John's-wood, N. W.</i>
1857	Dobie, Robert, Esq., M.D., R.N. 7, <i>Houghton-place, Amptill-square, Hampstead-road, N. W.</i>
1854	Dodson, John George, Esq., M.P. 6, <i>Scumore-place, Mayfair, W.</i>
1862	Dolben, Commr. Wm. Digby Mackworth, R.N. <i>H.M.S. 'Bloodhound,' W. Coast of Africa.</i>
1854	Domville, William T., Esq., M.D., R.N. <i>Army and Navy Club, S. W.</i>
1858	Donne, John, Esq. <i>Inston, North Devon.</i>
1864	Doran, Dr. John, F.S.A. <i>Royal-crescent, Notting-hill, W.</i>
1850	Dover, John William, Esq. 124, <i>Fenchurch-street, E.C.</i>
1854	560 Dower, John, Esq. 108, <i>Fleet-street, E.C.</i>

Year of  
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- 1853 Doyle, Sir Francis Hastings C., Bart. *Custom-house, E.C.*
- 1845 \*Drach, Solomon Moses, Esq. F.R.S. 39, *Holland-street, Fitzroy-square, W.*
- 1864 Drew, Major H. 14, *St. James's-square, S.W.*
- 1865 Drummond, E. A., Esq. 2, *Drymston-square, W.*
- 1846 Drummond, Lieut.-General John. *The Boyce, Dymock, Gloucestershire.*
- 1846 Drury, Capt. Byron, R.N. *The United Service Club, S.W.*
- 1857 Dublin, His Grace the Archbishop of. *Dublin.*
- 1851 \*Du Cane, Major Francis, R.E. 64, *Lowndes-square, S.W.*
- 1851 \*Ducie, Henry John, Esq., F.R.S. 30, *Prince's-gate, S.W.*
- 1859 570 Duckworth, Henry, Esq. 2, *Gambier-terrace, Liverpool.*
- 1860 \*Duff, Mountstuart Elphinstone Grant, Esq., M.P. 4, *Queen's-gate-jardens, South Kensington, W.*
- 1857 \*Dufferin, Right Hon. Lord, K.P., K.C.B. *Dufferin-hill, Fitzroy-park, Highgate, N.*
- 1866 \*Dugdale, Captain Henry Charles G. *Mireville-hall, Atherstone, Warwick.*
- 1864 Duke, Sir James, Bart. *Loughton-hill, Sussex.*
- 1863 Duncan, Capt. Francis, R.A., M.A., F.R.S. *The Citadel, Plymouth.*
- 1861 \*Duncan, George, Esq. 45, *Gordon-square, W.C.*
- 1840 \*Dundas, Right Hon. Sir David, Q.C., M.P. 13, *King's-Bench-walk, Temple, E.C.; and Ochterburn, Stirling.*
- 1860 Dunell, Henry James, Esq. 12, *Hyde-park-square, W.*
- 1859 \*Dunlop, R. H. Wallace, Esq., C.B., Indian Civil Service. *Messrs. Grindlay and Co., Parliament-street.*
- 1860 580 \*Dunmore, Charles Adolphus Murray, Earl of. 24, *Carlton-house-terrace, S.W.*
- 1837 \*Dunraven, Edwin Richard, Earl of, F.R.S. *Adare-moor, Limerick; and Dunraven-castle, Glamorganshire.*
- 1856 Duprat, Chevalier Alredo. *H.M.F. Arbitrator, Cape Town, Cape of Good Hope.*
- 1852 D'Urban, M. Gen. W. J. *Deputy Quartermaster-General, Canada; U. S. Club, S.W.; and Newport, near Exeter.*
- 1865 Dutton, F. S., Esq. *Reform Club, S.W.; and Adelaide, Australia.*
- 1861 Dyke, Commander Peché H., R.N. 3, *Southwick-place, Hyde-park, W.*
- 1854 Eardley-Wilmot, Capt. A. P., R.N., C.B. *H.M.S. 'Nile,' Queenstown. Care of Messrs. Stibbrell.*
- 1856 Eardley-Wilmot, Col. F., M.R.A. *Shoebury Ness, Essex.*
- 1866 Eardley-Wilmot, Sir John L. 3, *Elmston-place, Queen's-gate, W.*
- 1865 Eassie, William, Esq., F.L.S., 2, *Addison-villas, Notting-hill, W.*
- 1857 590 Eastwick, Captain W. J. 12, *Leinster-terrace, Hyde-park, W.*
- 1863 Eaton, F. A., Esq. *New University Club, St. James's-street, S.W.*
- 1862 \*Eaton, H., Esq. 16, *Prince's-gate, Hyde-park, W.*
- 1862 \*Eaton, Henry William, Esq., M.P. 16, *Prince's-gate, Hyde-park, W.*
- 1864 \*Eaton, William Meiton, Esq., 16, *Prince's-gate, Hyde-park, W.*
- 1866 Eatwell, W. C. B., Esq., M.P. 17, *Kensington-park-terrace, Notting-hill, W.*
- 1861 Eber, General F. 33, *St. James's-square, S.W.*

Year of Election.	
1862	Ebury, Lord. 107, <i>Park-street, Grosvenor-square, W.</i> ; and <i>Moor-park, Herts.</i>
1862	Eden, Rear-Adm. Charles, C.B. 20, <i>Wilton-place, S.W.</i>
1858	Edge, Rev. W. J., M.A. <i>Benenden-vicarage, near Staplehurst, Kent.</i>
1863	600 Edgeworth, M. P., Esq., BENG.C.S. <i>Mustrin-house, Anerly, S.</i>
1866	*Elwardes, Thomas Dyer, Esq. 5, <i>Hyde-park-gate, Kensington, W.</i>
1865	Edwards, G. T., Esq., B.A. 60, <i>Gloucester-terrace, W.</i>
1861	*Edwards, Henry, Esq. 53, <i>Berkeley-square, W.</i>
1860	Edwards, Major James B., R.E. <i>Junior United Service Club, S.W. Messrs. Smith, Elder, and Co.</i>
1857	Egerton, Commander Charles Randell, R.N. 7, <i>Rutland-gate, S.W.</i>
1853	Egerton, Captain the Hon. Francis, R.N. <i>Bridgewater-house, S.W.; and H.M.S. 'St. George.'</i>
1863	*Elder, George, Esq. <i>Knock-castle, Ayrshire.</i>
1867	Eley, Charles John, Esq. <i>Junior Athen. Club, S.W.; and Old Brompton, S.W.</i>
1865	Elias, Ney, Jun., Esq. 64, <i>Inverness-terrace, Bayswater, W.</i>
1862	610 Elkington, Lieut.-Col. J. H. F. <i>Army and Navy Club, S.W., and Park-street, Bath.</i>
1845	Ellenborough, Edward, Earl of, G.C.B. 110, <i>Eaton-square, S.W.; and Southam-house, near Cheltenham.</i>
1863	Ellerton, John L., Esq. 6, <i>Connaught-place, Hyde-park, W.</i>
1860	Elliot, George, Esq., C.E. <i>The Hull, Houghton-le-Spring, near Fence Houses, Durham.</i>
1857	*Elliot, Capt. L. R. <i>La Mulleraye-sur-Seine, Seine Inférieure.</i>
1830	*Elliott, Rev. Charles Boileau, M.A., F.R.S. <i>Tuttingstone, Suffolk.</i>
1861	Ellis, Rev. William. <i>Ross-hill, Huddersdon, Herts.</i>
1865	Ellis, W. E. H., Esq. <i>Horsfield-rectory, Gloucester; Oriental Club, W.; and Byculla Club, Bombay.</i>
1858	Elphinstone, Major Howard C., R.E. <i>Buckingham-palace, S.W.</i>
1857	Elton, Sir Arthur H., Bart. <i>Athenæum Club, S.W.; and Clevedon-court, Somersetshire.</i>
1862	620*Emanuel, Harry, Esq. 8, <i>Clarence-terrace, Regent's-park, N.W.</i>
1866	Emanuel, Joel, Esq., F.A.S. <i>Norfolk-villa, Ladbroke-road, Notting-hill, W.</i>
1863	Emslie, John, Esq. 47, <i>Gray's-inn-road, W.C.</i>
1830	Enderby, Charles, Esq., F.R.S., F.L.S. 13, <i>Great St. Helen's, E.C.</i>
1860	Enfield, Edward, Esq., F.S.A. 19, <i>Chest-r-terrace, Regent's-park, N.W.</i>
1863	Engleheart, Gardner D., Esq. 1, <i>Eaton-place-south, S.W.</i>
1832	Erskine, Vice-Admiral John Elphinstone, M.P., C.B. <i>H.M.S. 'Edgar;' 1 L, Albany, W., and Curdross, Stirling, N.B.</i>
1857	*Esmeade, G. M. M., Esq. 29, <i>Park-street, Grosvenor-square, W.</i>
1850	Espinasse, Major J. W., 12th Regt. <i>Messrs. Richardson, and Co., Cornhill.</i>
1865	Evans, Colonel William Edwyn. 24, <i>Great Cumberland-place, Hyde-park, W.</i>
1857	630 Evans, F. J., Esq., Staff Commander, R.N., F.R.S., F.R.A.S. 4, <i>Wellington-terrace, Charlton, Blackheath, S.E.</i>
1830	*Evans, Vice-Admiral George. 1, <i>New-street, Spring-gardens, S.W.; and Englefield-green, Chertsey.</i>

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- 1857 Evans, Thos. Wm., Esq., M.P. 1, *Dartmouth-street, Westminster, S. W.*; and *Allestree-wall, Derby.*
- 1830 \*Evans, W. Esq.
- 1861 Evelyn, Lieut.-Colonel George P. 4, *Onslow-crescent, Brompton, S. W.*
- 1851 \*Evelyn, William J., Esq., F.S.A. *Evelyn Estate Office, Evelyn-street, Deptford.*
- 1830 \*Everett, James, Esq., F.S.A.
- 1865 Everitt, George A., Esq. *Oakfield, Moseley, near Birmingham.*
- 1859 Ewart, William, Esq., M.P. 6, *Cambridge-square, W.*
- 1856 Ewing, J. D. Crum, Esq. 21, *Birchin-lane, E. C.*
- 1857 640 Lyre, Edward J., Esq.
- 1861 Eyre, George E., Esq. 59, *Loundes-square, Brompton, S. W.*
- 1856 Eyre, M.-Gen. Vincent, C.B. *Athenæum Club, S. W.*; and 33, *Thurlow-square, S. W.*
- 1861 Fairbairn, William, Esq., C.E., F.R.S. *Manchester.*
- 1856 Fairholme, George Knight, Esq. *Union Club, S. W.*; and *Ravenswood, Melrose, N. B.*
- 1866 Fauman, Edward St. John, Esq., F.G.S., &c. 874, *Via Santa Maria, Pisa*.  
*Care of H. Fairman, Esq., 20, Rochester-terrace, Camden-town, N. W.*
- 1838 Falconer, Thomas, Esq. *Usk, Monmouthshire.*
- 1857 Falkland, Lucius Bentinck, Viscount. *Skutterskelfe, Yorkshire.*
- 1855 \*Fanshawe, Admiral E. G. 63, *Eaton-square, S. W.*
- 1863 \*Farrer, W. Jas., Esq. 24, *Bolton-street, Piccadilly, W.*
- 1864 650 Faulkner, Charles, Esq. *DeJdington, Oxford.*
- 1863 \*Faunthorpe, Rev. J. P., B.A. *Training College, Battersea.*
- 1853 \*Fayrer, Joseph, Esq., M.D. *Calcutta. Care of General Spens, 14, Drum-mont-place, Edinburgh.*
- 1858 Fazakerley, J. N., Esq. 17, *Montagu-street, Portman-square, W.*
- 1866 Felkin, Wm., Esq., Jun., F.R.S. *Beckton, near Nottingham.*
- 1864 Fe. gusson, J., Esq. 6, *Gloucester-square, Hyde-park.*
- 1863 Feigusson, Alex., Esq. *Champion-hill, Conberrell, S.*
- 1840 \*Fergusson, James, Esq., F.R.A.S. 20, *Langham-place, W.*
- 1860 Ferro, Don Ramon de Silva.
- 1865 Field, Hamilton, Esq. *Thornton-road, Clapham-park.*
- 1830 660 Findlay, Alexander, Esq. *Hoyes, Kent, S. E.*
- 1844 Findlay, Alex. George, Esq. 53, *Fleet-street, E. C.*; and *Hoyes, Kent, S. E.*
- 1862 Finnis, Thomas Quested, Esq., Alderman. *Wanstead, Essex, N. E.*
- 1859 Fisher, Anthony L., Esq., M.D. 14, *Fork-place, Baker-street, Portman-square, W.*
- 1863 Fisher, John, Esq. 60, *St. James's-street, S. W.*
- 1859 Fisher, Robert, Esq.
- 1857 \*Fitzclarence, Commander the Hon. George, R.N.
- 1863 Fitzgerald, J. F. V., Esq. 11, *Chester-square, S. W.*
- 1861 Fitzgerald, Captain Keane. 2, *Portland-place, W.*
- 1864 Fitzpatrick, Lieut. Francis Skelton, 42nd Regt. Madras Army. 7, *Richmond-terrace, Westbourne-grove, W.*

Year of Election	
1859	670 *Fitz-Roy, George Henry, Esq. <i>Douashire-house, Roehampton; and Office of Maritime Customs, Shanghai.</i>
1857	Fitzwilliam, the Hon. C. W., M.P. <i>Brooks' Club, St. James's-street, S. W.</i>
1837	*Fitzwilliam, William Thomas, Earl. 4, <i>Grosvenor-square, W.; and Wentworth-house, Rotherham, Yorkshire.</i>
1865	*Fitzwilliam, Wm. S. Esq. 23, <i>Orington-square, Brompton, S. W.</i>
1863	Fleming, G., Esq. <i>Brompton Barracks, Chatham.</i>
1861	*Fleming, John, Esq. 13, <i>Leadenhall-street, E. C.</i>
1865	Fleming, Rev. T. S. <i>Roscoe-place, Chapel-town-road, Leeds.</i>
1853	*Fleming, Rev. Francis P. <i>Glenfernt, near Helensburgh, Glasgow.</i>
1862	Fletcher, John Charles, Esq. <i>Dale-park, Arundel; and Eaton-place, S. W.</i>
1857	Fletcher, Thomas Keddey, Esq. <i>Union-dock, Luncheon, E.</i>
1866	680 Flood, John Edwin, Esq. 126, <i>Hugh-street, Poplar, E.</i>
1864	Flower, Capt. L. 19, <i>Great College-street, S. W.; Banstead, Surrey; and Queen's United Service Club, S. W.</i>
1863	Foley, Col. the Hon. St. George. C. B.
1861	Foord, John Bromley, Esq. 52, <i>Old Broad-street, E. C.</i>
	Forbes, Commander Charles S., R.N. <i>Army and Navy Club, S. W.; and 18, James-street, Buckingham-gate, S. W.</i>
1860	
1863	Forbes, Lieut. C. J. F. Smith. <i>Cappoquin, Co. Waterford, Ireland.</i>
1860	Forbes, the Hon. Horace Courtenay, M.A. <i>Oriel College, Oxford.</i>
1845	Forster, Rev. Charles, B.D. <i>Stisted-rectory, Essex.</i>
1839	*Foister, William Edward, Esq., M.P. <i>Burley, near Otley.</i>
1861	Forsyth, William, Esq., M.P., Q.C. 61, <i>Rothind-gate, S. W.</i>
1864	690 Fort, Richard, Esq., M.P. <i>Road-hall, Whalley, Lancashire; and 24, Queen's-gate-gardens, South Kensington, W.</i>
1858	Fortescue, Chichester S., Esq., M.P. 7, <i>Carlton-gardens, S. W.</i>
1861	*Fortescue, Hon. Dudley F., M.P. 9, <i>Hertford-street, W.</i>
1864	Fortuné, C. F., Esq. <i>Trinidad, West Indies.</i>
1864	Foster, Capt. W. J. <i>Stubinjon-house, Furcham, Hants.</i>
1866	Foster, Edmund, Esq., Jun. 9, <i>Albion-street, Hyde-park, W.</i>
1864	Foster, H. J., Esq.
1863	*Fowler, J. T., Esq. <i>Government Inspector of Schools, Ahyr, Madras, India. Care of Rev. A. Wilson, National Society's Office, Sturminster, Westminster.</i>
1850	*Fowler, Robert N., Esq., M.A. 50, <i>Cornhill, E. C.; and Tottenham, N.</i>
1861	Fox, Arthur Douglas, Esq., C.E. 135, <i>Marine Parade, Brighton; and 8, New-street, Spray-gardens, S. W.</i>
1859	700 Fox, Lieut.-Colonel A. Lane. 10, <i>Upper Phillimore-gardens, Kensington, W.</i>
1830	*Fox, Lieut.-General C. R. <i>Travellers' Club, S. W.; and 1, Addison-road, Kensington, W.</i>
1866	Fox, D. M., Esq., Chief Engineer of the Santos and St. Paulo Railway. <i>St. Paulo, Brazil.</i>
1864	*Fox, F. E. Esq. <i>Ilmsley, Tottenham, Middlesex.</i>
1865	Fox, Samuel Crane, Esq. <i>Woodford-house, Granville-park, Blackheath, S. E.</i>

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Election.

- 1860 Fox, Thos., Esq., M.D. *Inspector-General of Hospitals, North Camp, Aldershot.*
- 1861 Franklin, Joseph Lewis, Esq. 148, *New Bond-street, W.*
- 1865 \*Franks, Aug. W., Esq. 55, *Upper Seymour-street, W.*
- 1860 Franks, Charles W., Esq.
- 1854 Fraser, Charles, Esq. 15, *Linchester-gate, Bayswater-road, W.*
- 1862 710 Fraser, Com. H. A., I.N.
- 1860 Fraser, Thos., Esq. *Literary Sec., Hudson Bay Co., Hudson-bay-house, E.C.*
- 1866 Fraser, Capt. T. *Otago, New Zealand.*
- 1860 Freeman, Daniel Alex., Esq., Barrister-at-law. *Plowden-buildings, Temple, E.C.*
- 1863 Fremantle, Commander Edmund Robert, R.N. 4, *Upper Eccleston-street, S.W.*
- 1856 Fremantle, Rt. Hon. Sir Thomas F., Bart. 4, *Upper Eccleston-street, Belgrave-square, S.W.*
- 1864 Fremantle, Lieut.-Col. Arthur. *Guards' Club, S.W.*
- 1864 Freme, Major James H. *Wrentham-house, Shropshire; and Army and Navy Club, S.W.*
- 1852 French, Dr. James, C.D. *Inspector-General of Hospitals, Graham's-hotel, Edinburgh.*
- 1850 Frere, Bartle John Laurie, Esq. 45, *Bedford-square, W.C.*
- 1839 720\*Fiere, George, Jun., Esq. *Cape of Good Hope; and 45, Bedford-square, W.C.*
- 1842 Frere, William Edw., Esq., F.R.A.S. *Dombay; and 45, Bedford-square, W.C.*
- 1853 Frith, John Griffith, Esq. 13, *Wingate-street, W.; and 11, Austin Friars, E.C.*
- 1859 Fryer, William, Esq. 39, *Marlborough-hall-gardens, St. John's-wood, N.W.*
- 1863 Fuidge, William, Esq. 5, *Park-row, Bristol.*
- 1855 Fuller, John, Esq.
- 1865 Fuller, Thomas, Esq. 119, *Gloucester-terrace, Hyde-park, W.*
- 1860 Fussell, Rev. J. G. Curry. 16, *Cadogan-place, S.W.*
- 1861 Fynes Clinton, Rev. Charles J., M.A. 3, *Montague-place, Russell-square, W.C.; and Cromwell, Notts.*
- 1866 Fytche, Colonel Albert. *Reform Club, S.W.*
- 1863 730\*Gabrielli, Antoine, Esq. 6, *Queen's-gate-terrace, Kensington, W.*
- 1858 Gai-ford, Thomas, Esq. *Travellers' Club, S.W.*
- 1861 Gallagher, John, Esq., M.D. *Reform Club, S.W.; and 109, Westbourne-terrace, W.*
- 1855 \*Galloway, John James, Esq.
- 1848 \*Galton, Capt. Douglas, R.E. 12, *Chester-street, Grosvenor-place, S.W.*
- 1850 \*Galton, Francis, Esq., M.A., F.R.S. 42, *Rutland-gate, S.W.; and 5, Bertie-terrace, Leamington.*
- 1854 \*Gammell, Major Andrew. *Drumtochty, Kincairdineshire, N.B.*
- 1861 Garden, Robert Jones, Esq. 63, *Montagu-square, W. Care of Messrs. Poulton and Co., 45, Great Chamberlain-street, W.*
- 1865 Gardner, Capt., G. H., R.N. *Coast-Guard Office, Spring-gardens, S.W.*
- 1866 Gardner, John Dunn, Esq. 122, *Park-street, Park-lane, W.*

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- 1863 740 Gardyne, D. J. B., Esq. *Trinity College, Oxford.*  
 1863 Gascoigne, Frederic, Esq. *Purlington, Yorkshi. e.*  
 1859 \*Gassiot, John P., Jun., Esq. 6, *Sussex-place, Regent's-park, N. W.*  
 1866 \*Gatty, Charles H., Esq., M.A., *Felbridge-park, East Grinstead, Sussex.*  
 1838 \*Gawler, Colonel George, K.H. *United Service Club, S. W.; and Southsea-villa, Southsea.*  
 1865 George, H. B., Esq. 63, *Lincoln's-inn-fields, W. C.*  
 1859 Gerstenberg, Isidore, Esq. 11, *Warnford-court, Throgmorton-street, E. C.*  
 1865 \*Gibbons, Sills John, Esq., Alderman. 13, *Upper Bedford-place, Russell-square, W. C.*  
 1866 \*Gibb, George Henderson, Esq., 13, *Victoria-street, Westminster, S. W.*  
 1859 \*Gibbs, H. Hucks, Esq. *St. Dunst-on's, Regent's-park, N. W.*  
 1864 750 Gibson, A., Esq. *Achnacloch, Brechin, N. B.*  
 1866 Gibson, John, Esq. 2, *Piccadilly, Bratford, Yorkshire.*  
 1855 Gillespie, Alexander, Esq. *Heathfield, Wilton-on-Thames, Surrey.*  
 1866 \*Gillespie, William, Esq. *Torbarn-hall, Edinburgh.*  
 1857 \*Gillespy, Thomas, Esq. *Brabant-court, Philpot-lane, E. C.*  
 1863 \*Gillett, William, Esq. 6L, *Albany, W.*  
 1891 Gilliat, Alfred, Esq. *Longham-house, near Wimborne, Dorset.*  
 1863 Gillies, Robert, Esq., C.E. *Dunedin, Otago, New Zealand.*  
 1867 Gisborne, Fred. N., Esq., Engineer and Electrician. 445, *West Strand, W. C.*  
 1836 Gladdish, Col. William. *Byeliffes, Gravesend.*  
 1864 760 Gladstone, George, Esq. *The Terrace, Clapham-common, S.*  
 1863 Gladstone, J. H., Esq., Ph.D. 17, *Pembroke-square, W.*  
 1862 \*Gladstone, Robert Stuart, Esq. 11, *New Broad-street, E. C.*  
 1846 \*Gladstone, William, Esq. 57½, *Old Broad-street, E. C.*  
 1864 \*Gladstone, W. K., Esq. 39, *Old Bond-street, W.; and Fitzroy-park, Highgate, N.*  
 1860 Glascott, Commander Adam Giffard, R.N., Acting Commissioner on the Turkish-Persian Frontier. *Messrs. Chard, 3, Clifford's Inn, Fleet-street, E. C.*  
 1857 Gleig, Rev. G. R., M.A. *Chaplain-General, Chelsea-hospital, S. W.*  
 1854 Glen, Joseph, Esq., Mem. Geogr. Soc. of Bombay. *Oriental Club, W.*  
 1857 Glover, Commr. John H., R.N. *Lagos; and Army and Navy Club, S. W.*  
 1866 Glover, Robert Reaveley, Esq. 30, *Great St. Helen's, E. C.*  
 1860 770 Glyn, Capt. H. Carr, R.N. 1, *Eccleston-street, Belgrave-square, S. W.*  
 1864 Glyn, Sir Richard, Bart. *Army and Navy Club, S. W.*  
 1862 Goddard, James, Jun., Esq. 14, *Mincing-lane, E. C.*  
 1863 Goldsmid, Lt.-Colonel Frederick John. *Harrow-on-the-hill; Southborough, Kent; and United Service Club, S. W.*  
 1861 Goldsmid, Julian, Esq. 20, *Portman-square, W.*  
 1860 Gooch, Thomas Longridge, Esq. *Team-lodge, Saltwell, Gateshead-on-Tyne.*  
 1864 Goodall, George, Esq. *Messrs. Cox and Co., Craig's-court; and Junior Carlton Club, W.*

Year of Election.	
1863	*Goodenough, Capt. J. G., R.N. <i>Junior U. S. Club, S.W. Care of Messrs. Stillwell, 22, Arundel-street, Strand, W.C.</i>
1864	*Goodenough, Major W., R.A. <i>Staff-college, Sandhurst, Farnborough Stat., Hants.</i>
1861	Gooldin, Joseph, Esq. 48, <i>Upper Hyde-park-gardens, W.</i>
1856	780 Gordon, Alexander, Esq., C.E. 2, <i>Vincent-square, Westminster, S.W.</i>
1856	*Gordon, Colonel the Hon. Alexander H., C.B.
1854	Gordon, Harry George, Esq. 1, <i>Clifton-place, Hyde-park-gardens, W.; and Killiechassi, Dornie, Perthshire.</i>
1856	Gordon, Admiral the Honourable John. 28, <i>Queen Anne-street, W.</i>
1853	Gordon, Vice-Admiral Robert. <i>United Service Club, S.W.</i>
1853	Gore, Richard Thomas, Esq. 6, <i>Queen-square, Bath.</i>
1853	Gorman, John, Esq., M.D.
1859	Gosling, Fred. Solly, Esq. 18, <i>New-street, Spring-gardens, S.W.</i>
1862	Goss, Samuel Day, Esq., M.D. 111, <i>Kennington-park-road, S.</i>
1855	Gould, Lieut.-Colonel Francis A. <i>Buntingford, Herts.</i>
1846	790 Gould, John, Esq., F.R.S., F.L.S. 26, <i>Charlotte-street, Bedford-square, W.C.</i>
1860	Gould, Nathaniel, Esq., F.S.A. 4, <i>Traistock-square, W.C.</i>
1865	*Gowen, Colonel J. E.
1867	Grabham, Michael, Esq., M.D. <i>Madeira. Care of C. R. Blandy, Esq., 25, Crutched Friars, E.C.</i>
1858	Graham, Cyril C., Esq. 9, <i>Cleveland-row, St. James's, S.W.; and Debroe-house, Watford, Herts.</i>
1861	Grant, Alexander, Esq. <i>Outfield House, Hornsey, N.</i>
1861	Grant, Daniel, Esq. 11, <i>Warrick-road, Upper Clapton, N.</i>
1865	*Grant, Francis W., Esq. <i>Army and Navy Club, S.W.</i>
1860	Grant, Major James A., C.B. <i>E. India U. S. Club, S.W.; and Dingwall, Rosshire, N.B.</i>
1860	Grantham, Capt. James. R.E. <i>Scarby, Brigg, Lincolnshire; and Royal Engineer Office, Leamington.</i>
1830	800*Gray, John Edw., Esq., PH. DR., F.R.S., Z.S. and L.S. <i>British Museum, W.C.</i>
1862	Greathed, Lieut.-Colonel Wilberforce, W. H., C.B.
1863	Greaves, Rev. Richard W., rector of Tooting. <i>Tooting, S.</i>
1861	Green, Capt. Francis. 89, <i>Eccleston-square, S.W.</i>
1830	Greene, Thomas, Esq. <i>Whittington-hall, near Burton, Westmoreland.</i>
1857	*Greenfield, W. B., Esq. 59, <i>Porchester-terrace, Hyde-park, W.; and Union Club, S.W.</i>
1865*	Greg, W. R., Esq., Comptroller of H.M.S. Stationery Office. <i>Wimbledon, S.W.</i>
1858	Gregory, Charles Hutton, Esq., C.E. 1, <i>Delahay-street, Westminster, S.W.</i>
1860	*Gregory, Francis Thomas, Esq. <i>Queensland.</i>
1858	*Gregory, Isaac, Esq. <i>Chorlton-hall, Victoria-park, Manchester.</i>
1857	810*Griell, Henry Robert, Esq. <i>Swanage-gardens, Tower-hill, E.C.</i>
1859	Grenfell, Chas. Pascoe, Esq. 38, <i>Belgrave-square, S.W.</i>
1865	Grenfell, Henry R., Esq., M.P. 15, <i>St. James's-place, S.W.</i>



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- 1838 Grenfell, Pascoe St. Leger, Esq. *Westey-house, Sransea.*
- 1853 Grenfell, Riversdale W., Esq. 27, *Upper Thames-street, E.C.*
- 1830 \*Greswell, Rev. Richard, M.A., F.R.S. 39, *St. Giles, Oxford.*
- 1866 Grey, Charles, Esq.
- 1837 \*Grey, Sir George, K.C.B. *Governor and Commander-in-Chief, New Zealand. Colonial Office.*
- 1844 \*Grey, Ralph Wm., Esq., Commissioner of Customs. 47, *Belgrave-square, S.W.; and Chipchase-castle, Hexham.*
- 1864 Grierson, Charles, Esq.
- 1862 820 Griffin, James, Esq. *The Retreat, Portsea; and The Hard, Portsea, Hants.*
- 1861 \*Griffith, Daniel Clewin, Esq. 20, *Gower-street, W.C.*
- 1839 Griffith, John, Esq. 16, *Finsbury-place-south, E.C.*
- 1863 Griffith, Sir Richard. 20, *Leckston-square, S.W.*
- 1856 Griffith, Richard Clewin, Esq. 20, *Gower-street, W.C.*
- 1855 Grindrod, R. B., Esq., M.D., LL.D., F.R.S., &c. *Townsend-house, Malvern.*
- 1864 Grinnell, C., Esq. *Burlington-chambers, 180, Piccadilly, W.*
- 1861 Grosvenor, Lord Richard, M.P. 33, *Upper Grosvenor-street, W.*
- 1858 Grote, George, Esq. 12, *St. Nile-row, W.*
- 1857 Gruneisen, Charles Lewis, Esq. 16, *Surrey-street, Strand, W.C.*
- 1862 830 Gunn, F. L. G., Esq., M.D., Army Medical Staff. *Bathurst, Gambia, W. Africa; and 346, Bath-crescent, Glasgow.*
- 1861 Gunnell, Commander Edmund H., R.N. *Army and Navy Club, S.W.; 21, Argyll-road, Campden-hill, W.*
- 1859 \*Gurney, John H., Esq. *Culton-hall, Norwich.*
- 1857 Gurney, Samuel, Esq., M.P. 25, *Prince's-gate, Hyde-park, S.W.; and Corshulton, Surrey.*
- 1862 Guthrie, James Alexander, Esq. 30, *Portland-place, W.*
- 1865 Gwyther, John H., Esq. 20, *Threadneedle-street, E.C.*
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- 1863 Hadfield, Wm, Esq., Secretary to the Buenos Ayres Railway Company. 11, *Inverness-road, Bayswater, W.*
- 1865 Hadley, Henry, Esq., M.D. *Needwood-bridge, Bay's-hill, Cheltenham.*
- 1863 Hadow, P. D., Esq. *Sudbury-priory, Middlesex.*
- 1865 Halcombe, Rev. J. J. *Chuter-house, E.C.*
- 1865 840 Hale, Warren S., Esq., Alderman. 71, *Queen-street, Chancery, E.C.*
- 1860 Haliday, Lieut.-Colonel William Robert. *United Service Club, S.W.*
- 1853 Halifax, Viscount, G.C.B., M.P. 10, *Belgrave-square, S.W.; and Hickleton, Yorkshire.*
- 1853 \*Halkett, Rev. Dunbar S. *Little Bookham, Surrey.*
- 1853 \*Halkett, Lieut. Peter A., R.N. *Windham Club, S.W.*
- 1861 Hall, Charles Hall, Esq. *Park-street, Cirencester.*
- 1863 Hall, Henry, Esq. 109, *Victoria-street, S.W.*

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- 1862 Hall, James Tebbutt, Esq. *Fore-street, Linchouse, E.*
- 1863 Hall, Thomas F., F.C.S. 29, *Warrick-square, S.W.*
- 1853 Hall, Admiral William Hutcheson, C.B., F.R.S. *United Service Club, S.W.; and 48, Phillimore-gardens, Kensington, W.*
- 1865 850 Hallett, Lieut. Francis C. H., R.H.A. *Junior United Service Club, S.W.*
- 1864 Halliday, Sir Fred. K.C.B. 14, *Queen's-gate-gardens, South Kensington, W.*
- 1856 Halloran, Alfred L., Esq., Staff Commr. 3, *Navy-terr., To point, nr. Devonport.*
- 1858 Halloran, Arthur B., Esq. *Principal of the South Devon Collegiate School, Houtree, Exeter.*
- 1862 Hamilton, Archibald, Esq. *South Barrow, Bromley, Kent, S.E.*
- 1861 Hamilton, Lord Claude, M.P. 19, *Eaton-st., S.W.; and Breas-coart, Co. Tyrone.*
- 1830 \*Hamilton, Capt. Henry G., R.N. 71, *Leicester-square, S.W.*
- 1861 Hamilton, Col. Robert William, Grenadier Guards. 18, *Leicester-square, S.W.*
- 1863 Hamilton, R., Esq. *Care of J. Foster Hamilton, Esq., 2, Gloucester-street, Portman-square, W.*
- 1830 Hamilton, Terriek, Esq. 121, *Park-street, Grosvenor-square, W.*
- 1866 860 Hamilton, Rear-Admiral C. Baillie. 50, *Warrick-square, S.W.*
- 1846 Hamilton, Rear-Admiral W. A. Baillie. *Macartney-house, Blackheath, S.E.*
- 1837 Hamilton, Wm. John, Esq., F.R.S. 23, *Chester-place, S.W.*
- 1862 \*Hanbury, Robert, Esq., M.P. 10, *Upper Grosvenor-street, W.*
- 1853 \*Hand, Capt. George S., R.N., C.B. *United Service Club, S.W.; and H.M.S. 'Victory.'*
- 1860 \*Handley, Benjamin, Esq., Assistant-Commr. Turko-Persian Frontier. *British Embassy, St. Petersburg; and Grafton Club, Grafton-street, W.*
- 1866 Hanham, Commr. T. B., R.N. *Manston-house, near Bladford, Dorset.*
- 1861 \*Hankey, Blake Alexander, Esq. 38, *Portland-place, W.*
- 1857 Hankey, Thomson, Esq., M.P. 45, *Portland-place, W.*
- 1837 \*Hammer, Sir J., Bart., M.P., F.R.S. *Hammer-hill and Bettisfield-park, Flintshire.*
- 1859 870 \*Hansard, Henry, Esq. 13, *Great Queen-street, W.C.*
- 1840 \*Harcourt, Egerton V., Esq. *Whitehall-hall, York.*
- 1864 \*Hardie, Gavin, Esq. 113, *Piccadilly, W.*
- 1864 Harding, Charles, Esq. *Grafton Club, 10, Grafton-street, Piccadilly, W.*
- 1864 Harding, J. J., Esq. 1, *Burnsby-g-park, Isington, N.*
- 1864 Hardinge, Capt. E., R.N. 32, *Hyde-park-square, W.*
- 1861 Hardinge, Henry, Esq., M.D. 18, *Grafton-street, Bond-street, W.*
- 1862 Hardman, William, Esq., M.A. *Norbiton-hall, Kingston-on-Thames.*
- 1864 Hardwicke, B. Esq. 43, *Russell-square, W.C.*
- 1855 Harris, Archdeacon the Hon. C. A. *Brentford-terrace, Chiswick.*
- 1853 880 Harris, Admiral the Hon. E. A. J., C.B. *H.B.M.'s Envoy Extraordinary and Minister Plenipotentiary, Legation Britannique, Berne. Messrs. Woodhead.*
- 1852 Harris, George Frederick, Esq., M.A. *Harrold-park, Middleser, N.W.*
- 1859 Harris, Capt. Henry, H.C.S. 35, *Gloucester-terrace, Hyde-park, W.*
- 1865 Harris, John M., Esq. 12, *Holland-terrace, Holland-road, Kensington, W.*

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1863	Harrison, Chas., Esq. <i>Larrie-park, Sydenham; and 3, Gt. Tower-st., E.C.</i>
1859	Harrison, C. H. Rogers, Esq., F.R.C.S. 13, <i>Lansdowne-road, Clapham-road, S.</i>
1865	*Harrison, William, Esq., F.S.A., F.G.S., &c. <i>Conservative Club, S.W.; Royal Thames Yacht Club, 7, Albemarle-street, W.; Galligrevilles-hall, near Blackburn, Lancashire; and Somesbury-hall, near Preston, Lancashire.</i>
1838	Harrowby, Dudley, Earl of. <i>Sandon-ho., Lichfield; and Norton, Gloucestershire.</i>
1854	*Hartland, F. Dixon, Esq., F.S.A., &c. 60, <i>Pall Mall, S.W.</i>
1863	Harvey, Charles, Esq. <i>Rathgate-cottage, Streatham, S.</i>
1864	890 Harvey, John, Esq. <i>Ichuell Bury, Dipplesuade.</i>
1864	Harvey, John, Esq. 7, <i>Mincing-lane, E.C.</i>
1864	Harvey, W. D., Esq. 52, <i>Nottam-hill-square, S.W.</i>
1846	Harvey, W. S., Esq., R.N. <i>H.M.S. 'Humbal,' Mediterranean.</i>
1865	Harvey, C. H., Esq., M.D. 17, <i>Whitchall-place, S.W.</i>
1866	Harvey, Richard M., Esq. <i>Oxford and Cambridge Club, S.W.</i>
1859	Harwood, H. Harwood, Esq. 29, <i>Cleveland-square, Hyde-park, W.</i>
1858	Hawker, Edward J., Esq. 37, <i>Cardigan-place, S.W.</i>
1834	Hawkins, Francis Bisset, Esq., M.D., F.R.S. 29, <i>Upper Harley-street, W.; and Lewell-lodge, Dorchester.</i>
1857	Hawkins, Capt. Frank K., R.N. <i>Army and Navy Club, S.W.</i>
1840	900*Hawkins, John, Esq.
1858	*Hawkins, Col. J. Summerfield, R.E. <i>Woolrich, S.E.</i>
1861	Hawksley, Thomas, Esq., C.E. 14, <i>Phillimore-gardens, Kensington, S.W.</i>
1860	Haworth, Frederick, Esq. 9, <i>Eccleston-street, S.W.</i>
1852	*Hay, Rear-Admiral Sir J. C. Dalrymple, Bart., M.P., F.R.S. 108, <i>St. George's-square, S.W.; U. S. Club, S.W.; Dunragit, Glenbucc; and Harrow-on-the-hill, N.W.</i>
1863	*Hay, Lord John. 15, <i>Cromwell-road, South Kensington, W.</i>
1865	Hay, Lord William. 2, <i>Cleveland-row, S.W.</i>
1859	Hay, Major W. E. <i>Linden-lodge, Loan-head, near Edinburgh.</i>
1864	Haysman, James, Esq. <i>Burdett-house, Burdett-road, E.</i>
1862	Head, Alfred, Esq. 13, <i>Craven-hill-gardens, Bayswater, W.</i>
1863	910 Headlam, Right Hon. Thos. E., M.P. 27, <i>Ashley-place, Victoria-street, S.W.</i>
1856	Heath, J. Benj., Esq., F.R.S., F.S.A., Consul for Sardinia. 31, <i>Old Jewry, E.C.</i>
1863	Heathfield, W. E., Esq. 20, <i>King-street, St. James's, S.W.</i>
1861	Hector, Alexander, Esq. 6, <i>Stimley-gardens, Bayswater, W.</i>
1861	Hector, James, Esq., M.D. <i>Care of E. Stanford, Esq.</i>
1862	Hemans, Geo. Willoughby, Esq., C.E. 13, <i>Queen's-square, Westminster, S.W.</i>
1856	Henderson, Andrew, Esq. 102, <i>Gloucester-place, Portman-square, W.</i>
1837	*Henderson, James, Esq. <i>Litt'wood-park, Forbes, Aberdeenshire.</i>
1853	Henderson, John, Esq. <i>Conservative Club, S.W.; and Valparaiso.</i>
1866	Henderson, Patrick, Esq. <i>Care of Captain H. J. Strutt, Royal Mail Steam Packet Company, Southampton.</i>
1864	920 Henderson, R., Esq. 7, <i>Mincing-lane, E.C.</i>
1852	Henderson, William, Esq. 5, <i>St Luke's-street, Hyde-park-gardens, W.</i>

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- 1844 \*Heneage, Edward, Esq. *Stuf's-end, Hemel Hempstead.*
- 1861 Henn, Rev. J., B.A., Head Master of the Manchester Commercial Schools. *Old Trafford, Manchester.*
- 1860 Hennessey, J. B. N., Esq. *1st Asst. Trij. Survey of India, Dehra in the Doon, N.W. Provinces, India. Care of Messrs. Smith, Elder, and Co.*
- 1862 Henry, Capt. R. J. *Army and Navy Club, S.W.*
- 1838 \*Henry, Wm. Chas., Esq., M.D., F.R.S. *Hoffield, near Ledbury, Herefordshire.*
- 1861 \*Henty, Douglas, Esq. *Chichester.*
- 1864 Herbert, George, Esq. *University School, near Nottingham.*
- 1857 Herd, Captain D. J. *2, Norway-house, Lincolns, E.*
- 1858 930 Hertslet, Edward, Esq. *Librarian, Foreign Office, S.W.; and Belle-rue-house Richmond, S.W.*
- 1841 Hessey, James Augustus, Esq. *Manningford Bruce, Porssey, Wilts.*
- 1861 Heugh, John, Esq. *Tonbridge-wells.*
- 1856 Hewitt, James, Esq. *Rottingdean, Brighton.*
- 1840 \*Heywood, James, Esq., F.R.S. *Athenæum Club, S.W.; and 26, Kensington-palace-gardens, W.*
- 1860 Heyworth, Capt. Lawrence, 4th Royal Lancashire. *Im. United Service Club, S.W.*
- 1853 Hickey, Edwin A., Esq. *29, King-street, St. James's, S.W.*
- 1856 Hill, Arthur Bowdler, Esq. *South-road, Chyham-park, Surrey, S.*
- 1866 Hill, Berkeley, Esq. *14, Weymouth-street, Portland-place, W.*
- 1867 Hill, O'Dell Travers, Esq. *19, Kidare Terrace, Westbourne Park, W.*
- 1854 940 Hill, Lieut.-Colonel Stephen J. *Care of Capt. E. Burnett, R.N., 14, Woburn-square, W.; Army and Navy Club, S.W.; and Governor of Antigua.*
- 1865 Hill, Samuel S., Esq. *Reform Club, S.W.; and 37, Sackville-st., Piccadilly, W.*
- 1861 Halliard, Major George Towers, Madras Staff Corps. *11, Lansdowne-road, Kensington-park, Nottingham, W.*
- 1858 Hinchliff, T. Woodbine, Esq., Barrister-at-Law. *64, Lincoln's-inn-fields, W.C.*
- 1859 Hind, Professor Henry Youle, M.A. *Toronto, Canada West.*
- 1862 \*Hinde, Samuel Henry, Esq. *Windham Club, S.W.*
- 1846 \*Hindmarsh, Frederick, Esq. *17, Bucklersbury, E.C.*
- 1861 Hoare, Deane John, Esq. *Royal Thames Yacht Club, Albemarle-street, W.*
- 1855 Hobbs, Wm. Geo. Ed., Esq. *Master of Grammar School, Wareside, near Ware.*
- 1850 \*Hobhouse, Henry William, Esq. *24, Cadogan-place, S.W.*
- 1866 950 Hockly, John Minett, Esq., R.N. Harbour Master, Shanghai, and Conservator of the Yang-tse-Kiang River. *Plimpton St. Mary, Devon.*
- 1856 \*Hodgson, Arthur, Esq., Superintendent of the Australian Agricultural Company. *Drayton-hall, West Drayton, near Uxbridge.*
- 1861 \*Hodgson, James Stewart, Esq. *8, St. Helen's-place, E.C.*
- 1857 Hodgson, Kirkman Daniel, Esq., M.P. *8, St. Helen's-place, E.C.*
- 1856 Hogg, James, Jun., Esq. *31, Mecklenburg-square, W.C.*
- 1830 Hogg, John, Esq., M.A., F.R.S., F.L.S., V.-Pres. Royal Society of Literature &c. *8, Sergeants'-inn, Temple, E.C.; and Norton-house, Stockton-upon-Tees.*

Year of Election.	
1865	Hole, Charles, Esq. 1, <i>St. James-road, Brixton, S.</i>
1839	*Holford, Robert S., Esq., M.P. <i>Dorchester-house, Park-lane, W.</i>
1830	Holland, Sir Henry, Bart., M.D., F.R.S. 25, <i>Lower Brook-street, W.</i>
1861	Holland, Colonel James. 24, <i>Prince's-square, Kensington-gardens, W.</i>
1863	960 Holland, Loton, Esq. 6, <i>Queen's-villas, Windsor.</i>
1862	Holland, Robert, Esq. <i>Stunmore-hall, Great Stunmore, Middlesex.</i>
1861	*Hollingsworth, John, Esq., M.R.C.S. <i>Maidstone-house, Greenwich, S.E.</i>
1861	Holme, J. Wilson, Esq., M.A. <i>Dounswood, Beckenham, Kent, S.E.</i>
1835	*Holmes, James, Esq. 4, <i>New Ormond-street, Queen-square, W.C.</i>
1864	Holmes, Capt. R. C. 1, <i>Richmond-villas, Beckley-heath, S.E.</i>
1862	Holmes, Sir William H.
1861	Holms, John, Esq. 16, <i>Cornwall-gardens, Queen's-gate, W.</i>
1839	*Holroyd, Arthur Todd, Esq., M.D., F.L.S. <i>Athenaeum Club, S.W.</i>
1857	Holroyd, Henry, Esq. Barrister-at-Law. 2, <i>Elm-court, Temple, E.C.</i>
1864	970 Holt, Vesey, Esq. 63, <i>Warwick-square, W.</i>
1857	Homfray, Frederick Samuel, Esq., C.E. 6, <i>Storey's-gate, S.W.</i>
1857	Homfray, William Henry, Esq. 6, <i>Storey's-gate, S.W.</i>
1864	*Hood, Sir Alex. Acland, Bart., M.P. <i>St. Andrie's-park, Bridgewater, Somerset.</i>
1862	Hood, Henry Schuback, Esq. <i>War Office, S.W.; and 10, Kensington-park-gardens, W.</i>
1861	Hood, T. H. Cockburn, Esq. <i>Stoneridge, Bervickshire.</i>
1859	*Hood, Wilham Charles, Esq., M.D. <i>Bethlehem Hospital, S.</i>
1866	*Hooker, Joseph, Esq., M.D., F.R.S., F.L.S., &c. <i>Director of the Royal Gardens, Kew.</i>
1861	Hopcraft, George, Esq. 3, <i>Balliter-square, E.C.</i>
1846	*Hope, Alex. James Beresford, Esq., M.P. <i>Arklox-house, Connought-place, Hyde-park, W.; and Bedjebury-park, Hurst-green, Kent.</i>
1862	980 Hope, Capt. C. Webley, R.N. <i>H.M.S. 'Brisk,' Australia; Messrs. Hallett &amp; Co.</i>
1857	Hoper, Richard, Esq. <i>Confold, Horsham, Sussex.</i>
1861	Hoskins, Capt. A. H., R.N. <i>Army and Navy Club, S.W.</i>
1859	Hoskyns, Chandos Wren, Esq. <i>Wrachall-abbey, Warwickshire.</i>
1853	Houghton, Lord. 16, <i>Upper-brook-street, W.; The Hall, Buxtry; and Fryston-hall, Ferrybridge, Yorkshire.</i>
1856	Hovell, William Hilton, Esq. <i>Goulburn, New South Wales. Care of Mr. W. Chamberlain, 74, Fleet-street, E.C.</i>
1864	Howell, W. G., Esq.
1853	Howard, Sir Ralph, Bart. 17, <i>Belgrave-sq., S.W.; and Bushy-park, Wicklow.</i>
1857	Howard, Samuel Lloyd, Esq. <i>Goldings, Loughton, Essex.</i>
1842	*Hubbard, J. Gellibrand, Esq., M.P. 24, <i>Prince's-gate, Hyde-park-south, W.</i>
1866	990 Hudson, Robinson, Esq. (Surgeon). <i>R. M. S. Officers' Home, Southampton.</i>
1857	Hughes, Capt. Sir Frederic. <i>Ely-house, Weyford.</i>
1838	Hughes, William, Esq. 63, <i>Oakley-square, St. Pancras, N.W.</i>
1838	*Hume, Edmund Kent, Esq.
1860	*Hume, Hamilton, Esq. <i>Cooma Pass, New South Wales. Care of Rev. A. Hume, 24, Fitzclarence-street, Liverpool.</i>

Year of Election.	
1861	Hunt, George S. Lennox, Esq., H.B.M. Consul, <i>Pernambuco</i> .
1866	Hunt, Joseph, Esq. <i>Cure-house Uxbridge, Middlesex.</i>
1865	Hunt, Capt. Thomas, R.H.A. <i>The Baricks, Mundstone.</i>
1857	Hunt, Zacharias Daniel, Esq. <i>Aylesbury.</i>
1862	Hunter, Henry Lannoy, Esq. <i>Beech-hill, Reading.</i>
1858	1000 Hutchinson, Thomas J., Esq., F.R.S.L., F.R.S., F.A.S.L., H.B.M. Consul, <i>Rosario, Argentine Republic.</i> <i>Care of J. B. Alston, Esq., Foreign-office.</i>
1864	Hutchinson, Capt. R. R. 12, <i>Mornington road, Bromley, Middlesex.</i>
1851	Hyde, James Bartlet, Esq. 43, <i>Priory-road, Kilburn, N.W.</i>
1860	*Hyde, Captain Samuel. 8, <i>Billiter-square, E.C.</i>
1865	Illingworth, Rev. Edward A. 3, <i>Mecklenburg-street, W.C.</i>
1852	Illingworth, Richard Stonbower, Esq. 9, <i>Norfolk-crescent, Hyde-park, W.</i>
1850	*Imray, James Frederick, Esq. 102, <i>Minories, E.; and Beckenham, Kent, S.E.</i>
1861	*Ingall, Samuel, Esq. 1, <i>Old Broad-street, E.C.; and Forest-hill, Kent, S.E.</i>
1860	Ingilby, the Rev. Henry John. <i>Ripley-castle, Ripley, Yorkshire.</i>
1851	Inglefield, Captain Edward A., R.N., F.R.S. <i>United Service Club, S.W.; and</i> 10, <i>Great End-road, St. John's Wood, N.W.</i>
1846	1000 Ingram, Hughes Francis, Esq. <i>University Club, S.W.</i>
1860	*Inskip, G. H., Esq., Master R.N. <i>H.M. Surveying Vessel 'Seyflower,' and</i> 23, <i>Anne-street, Sunderland.</i>
1852	*Inskip, Rev. Robert Mills. 8, <i>Boon's-place, Plymouth.</i>
1840	*Iuby, Frederick W., Esq. <i>Athenæum Club, S.W.</i>
1864	*Irving, John, Esq.
1853	Irving, Thomas, Esq. 6, <i>Minerva-terrace, Burnsby-park, Islington, N.</i>
1861	Iwim, James V. H. 8, <i>Dike-street, St. James's, S.W.</i>
1864	Ives, W. F., Esq. <i>St. John's School, Linchouse, E.</i>
1865	Izard, Frederick, Esq., 141, <i>High Holborn, W.C.</i>
1866	Jackson, Robert Ward, Esq. 28, <i>Inverness-road, Hyde-park, W.</i>
1855	1020 Jackson, William, Esq., M.P. 10, <i>Mansfield-street, W.</i>
1862	Jacomb, Thomas, jun., Esq. 23, <i>Old Broad-street, Gresham-house, E.C.</i>
1866	James, Major Geo. A. 22, <i>Essex-street, Strand, W.C.</i>
1857	James, Colonel Sir Henry, R.E., F.R.S. <i>Director of the Ordnance Survey,</i> <i>Southampton.</i>
1861	James, William Bosville, Esq. 13, <i>Blomfield-road, Maiden-hill, W.</i>
1862	*Jaques, Leonard, Esq. <i>Lasby-abbey, Richmond, Yorks.</i>
1863	*Jardine, Andrew, Esq. <i>Lomrick-castle, Stirling.</i>
1863	*Jardine, Robert, Esq., M.P. <i>Castlemill, Lockerby, N.B.</i>
1857	Jefferson, Richard, Esq. 44, <i>The Albany, W.</i>
1863	Jeffreys, Edw. W. <i>Conservatore Club, S.W.</i>
1865	1030 Jeffreys, J. G., Esq. 25, <i>Devonshire-place, W.</i>

Year of Election.	
1860	*Jejeebhoy, Sir Jamsetjee, Bart. <i>Bombay.</i>
1854	Jellicoe, Charles, Esq. 23, <i>Chester-terrace, N. W.</i>
1859	Jencken, H. Diedrich, Esq. 1, <i>Brick-court, Temple, E. C.</i> ; and 2, <i>Fork-terrace, Upper Sydenham, S. E.</i>
1854	Jenkins, Capt. Griffith, L.S., C.B. <i>East India Club, St. James's-square, S. W., and Derwen, Welch Pool, Montgomeryshire.</i>
1837	*Jenkins, R. Castle, Esq. <i>Beachley, near Chesham.</i>
1854	*Jennings, William, Esq., M.A. 13, <i>Victoria-street, Westminster, S. W.</i>
1862	Jerdein, John, Esq.
1860	Jermyn, Rowland Formby, Esq. <i>War Office, S. W.</i>
1860	Jessopp, Rev. Augustus, M.A., Head Master, King Edward VI. School. <i>Norwich.</i>
1864	1840 *Jeula, Henry, Esq. <i>Lloyd's, E. C.</i>
1864	*Jeyes, F. F., Esq. <i>Castle-hill, Edinb., W.</i>
1847	Johnson, Edmund Chas., Esq. 33, <i>Albany, Piccadilly, W., and 6, Savile-row, W.</i>
1859	*Johnson, Henry, Esq. 39, <i>Crutched-friars, E. C.</i>
1854	Johnson, John Hugh, Esq.
1861	Johnson, William, Esq., R.N. <i>Junior Carlton Club, S. W.</i>
1866	Johnson, W. H., Esq., Civil Assistant G. T. S. India. <i>Dehra Dun, N. W. Provinces, India.</i>
1843	Johnston, Alex. Keith, Esq., F.R.S.E., Hon. Mem. Berl. Geog. Soc., &c. <i>March-hall-park</i> ; and 4, <i>St. Andrew-square, Edinburgh.</i>
1856	Johnston, A. R., Esq., F.R.S. <i>Athenæum Club, S. W.</i>
1857	Johnston, J. Brookes, Esq. 29, <i>Lombard-street, E. C.</i>
1858	1850 Johnston, Capt. J. Gilbert. 8, <i>Fork-terrace, Regent's-park, N. W.</i>
1866	Johnstone, Major H. C. <i>Murree, Punjab, India.</i>
1853	Johnstone, Sir John V. B., Bart., M.P., D.C.L. 34, <i>Belgrave-square, W.</i> ; and <i>Hackness-hall, near Scarborough.</i>
1858	Jones, Capt. Edward Monckton, 20th Regt. <i>Care of Rev. H. Parsons, Sandhurst Rectory, Wokingham.</i>
1864	Jones, Capt. Felix. <i>Ternside, Church-road, Weston-hill, Upper Norwood, S.</i>
1857	Jones, Capt. Jenkin, Bombay Engineers. 1, <i>Lennard-place, Circus-road, St. John's-wood, N. W.</i> ; and <i>India.</i>
1862	Jones, John, Esq. 338, <i>Strand, W. C.</i>
1861	Jones, John Pryce, Esq. <i>Grove-park School, Wrexham.</i>
1861	Jones, Sir Willoughby, Bart. <i>Cranmer-hall, Fakenham, Norfolk.</i>
1863	Joshua, Moss, Esq. <i>Melbourne</i> ; and 22, <i>Clifton-gardens, Maida-hill, W.</i>
1863	1860 Jourdain, Frederick John, Esq. 10, <i>Austin-friars, E. C.</i>
1858	Kay, David, Esq. 17, <i>Abingdon-terrace, Kensington, W.</i>
1865	Kaye, J. W., Esq. <i>India Office, Victoria-street, S. W.</i>
1866	*Kean, Charles, Esq. 39, <i>George-street, Hanover-square, W.</i>
1860	Keate, R. W., Esq., Lieutenant-Governor, <i>Trinidad.</i>
1857	Keating, Sir Henry Singer, Q.C., one of the Judges of the Court of Common Pleas. 11, <i>Prince's-gardens, S. W.</i>

Year of Election.	
1857	Keene, Rev. C. E. Ruck. <i>Swynscombe-park, Henley-upon-Thames.</i>
1863	Keir, Simon, Esq. <i>Conservative Club, S.W.</i>
1845	*Kelleff, Br.-Adm. Henry, C.B. <i>Colonnel, Ireland.</i>
1861	Kelly, William, Esq. <i>Royal Thames Yacht Club, 7, Albemarle-street, W.</i>
1860	1070*Kemball, Col. Arnold Burrowes, C.B., Indian Army. <i>H.M.'s Consul-General. Baghdad; and 6, Chester-place, Hyde-park, W.</i>
1863	Kempster, J., Esq. <i>1, Portsmouth-place, Kennington-lane, Surrey, S.</i>
1860	Kendall, Henry, Esq., Consul for Peru. <i>12, Old Broad-street, E.C.; and The Limes, Mortlake, S.W.</i>
1861	Kennard, Adam Steinmetz, Esq. <i>7, Finchurch-street, E.C.</i>
1859	Kennard, Coleridge J., Esq. <i>14, Lombard-street, E.C.; and 13, Prince's-terrace, Prince's-gate, S.W.</i>
1861	Kennard, Robert William, Esq., M.P. <i>37, Porchester-terrace, Hyde-park, W.</i>
1861	Kennedy, Edward Shirley, Esq. <i>Esher, Surrey.</i>
1863	Kennedy, Lord Gilbert. <i>West-court, Wokingham.</i>
1854	Kennedy, Rev. John, M.A. <i>4, Stepney-green, E.</i>
1851	Kent, John, Esq. <i>Shafston, Morceton-by, Australia.</i>
1864	1080Kerr, Lord Schomberg. <i>15, Bruton-street, W.</i>
1863	Kerr, J. H., Esq., R.N. <i>Hydrographic Office, S.W.</i>
1866	Kerr, Wm. Hobart, Esq. <i>Huntly-burn, Melrose, N.B.; and 14, St. James's-square, S.W.</i>
1862	Kershaw, Wm., Esq. <i>16, St. Mary Axe, E.C.; and Suffolk-lodge, Brixton-road, S.</i>
1859	Key, Capt. Astley Cooper, R.N., C.B. <i>United Service Club, S.W.</i>
1862	Key, J. Bunney, Esq. <i>Oriental Club, W.</i>
1857	Keysell, Francis P., Esq. <i>Sycamore-villa, 35, Carlton-hall, St. John's-wood, N.W.</i>
1864	*Kiddle, W. W., Esq.
1864	Kimber, Dr. E. <i>Murchison-house, Dalnair, S.</i>
1866	King, John, Esq. <i>The Russetts, Thames Ditton, Surrey.</i>
1846	1090King, Lieut.-Colonel Edward R., 36th Regt. <i>Junior United Service Club, S.W.</i>
1858	King, Rev. Samuel W., A.M. <i>Sacringham-rectory, Norwich.</i>
1861	King, Major W. Ross, Unatt., F.S.A. Scot. <i>Tertonie, Kinellar, Aberdeenshire; and Army and Navy Club, S.W.</i>
1857	*Kinnaird, Hon. Arthur F., M.P. <i>2, Pall-mall-east, S.W.</i>
1860	Kiuns, Samuel, Esq., PH. DE., F.R.A.S. <i>Highbury-new-park College, N.</i>
1858	Kirk, John, Esq., M.D. <i>45, George-square, Edinburgh.</i>
1863	Kuke, John, Esq., Barrister. <i>C. Thorold, Esq., Welham, Rutford, Notts; and 32, Harley-street, Cavendish-square, W.</i>
1861	Kirkland, Sir John. <i>17, Whitehall-pl., S.W.; and Foot's-croft-pl., Kent, S.E.</i>
1866	*Kitson, James, Jun., Esq. <i>Hammer-square, Leeds.</i>
1833	*Kjaer, Thomas Andreas, Esq. <i>Hjorset af Kongens Nytor og Gathersgaden No. 26, 3d Suhl, Copenhagen.</i>
1862	1100Knollys, Lieut.-General W. T., V.-Pres. Council of Military Education. <i>Eaton-square, S.W.</i>



Year of Election.	
1861	Knox, Thomas G., Esq. <i>India.</i>
1861	Kyd, Hayes, Esq., M.R.C.S. <i>Wadebridge, Cornwall.</i>
1859	Labrow, Lieut.-Colonel Valentine H., F.S.A., F.G.S. <i>Mitre-court-chambers, Temple, E.C.; and Club-chambers, S.W.</i>
1849	*Lafian, Capt. Robert Michael, R.E. <i>Army and Navy Club, S.W.; and Otham-lodge, Kent.</i>
1859	Lamb, Lieut. Henry, I.N. <i>H.M. India Store Department, Belvedere-road, Lambeth, S.</i>
1863	*Lambert, Alan, Esq. <i>Heath-lodge, Putney-heath, S.W.</i>
1864	Lambert, Charles, Esq. 2, <i>Queen-street-place, Upper Thames-street, E.C.</i>
1867	Lambert, Wm. Blake, Esq., C.E. 21, <i>Queen Anne-street, Curkendish-square, W.</i>
1864	Lamert, Capt. G. F. 20, <i>Albemarle-street, W.</i>
1861	1110 Lamont, James, Esq., M.P. <i>Brooks's Club, S.W.</i>
1866	Lampray, John, Esq. 16, <i>Cumtlen-square, N.W.</i>
1865	Lampray, Thomas, Esq. <i>Warrior-lodge, The Grove, Hammersmith, W.</i>
1867	Lamprey, Jones, Esq., M.B., 67th Regt.
1864	Lampson, C. M., Esq. 64, <i>Queen-street, Chopsale, E.C.</i>
1838	*Lance, John Henry, Esq., F.L.S. <i>The Holmwood, Dorking.</i>
1861	*Lang, Andrew, Esq. <i>Dunmore, Hunter-river, New South Wales; and Dunmore Tenynmonth, Devon</i>
1859	*Lange, Daniel A., Esq. 21, <i>Regent-street, W.</i>
1867	Langlands, John, Esq., Engineer. <i>Melbourne, Australia.</i>
1856	Langler, J. R., Esq., Lecturer, Wesleyan Normal Institution. <i>Westminster, S.W.</i>
1865	1120 Langley, Edward, Esq. <i>Well-hall, Eltham, Kent.</i>
1833	*Larcom, Maj.-General Sir Thomas Aiskew, R.E., K.C.B., F.R.S. <i>Castle, Dublin.</i>
1861	Laidner, Col. John. <i>United Service Club, S.W.</i>
1859	Larnach, Donald, Esq. 21, <i>Kensington-palace-jardens, W.</i>
1854	Latrobe, Ch. J., Esq. <i>Athenium Club, S.W.; and Whitbourne-court, Worcester.</i>
1862	*Laurie, John M., Esq. 4, <i>St. George's-place, S.W.; and Macraeltton-house, Thornhill, Dumfriesshire.</i>
1846	*Law, Hon. H. Spencer, M.A. 1, <i>Louder-st., S.W.; and Ellington-ho., Ramsgate.</i>
1830	Law, William J., Esq. 63, <i>Upper Seymour-street, W.; 23, Lincoln's-inn-fields, W.C.; and 5, Sussex-square, Brighton.</i>
1861	Lawrence, Edward, Esq. <i>Beechmont, Aliphuth, Liverpool.</i>
1862	*Lay, Horatio, N., Esq., Commissioner of Foreign Customs in China.
1857	1130 Layard, Austen H., Esq., M.P., D.C.L. 130, <i>Piccadilly, W.</i>
1866	*Layard, Lieutenant Brownlow Villiers (3rd W. India Regt.). 39, <i>Upper Mount-street, Dublin; and Lane's Hotel, 1, St. Anne's-place, S.W.</i>
1860	Leader, Nicholas P., Esq., M.P. <i>Conservative Club, S.W.; and Dromagh, Cork.</i>
1863	*Leaf, Chas. J., Esq. <i>Old-change, E.C.; and The Rylands, Norwood, S.</i>
1861	*Learmonth, Dr. John. <i>Putwell, near Ludlithgow.</i>
1866	Lebour, G. A., Esq. 6, <i>Addison-crescent, Kensington, W.</i>

Year of  
Election

- 1853 \*Le Breton, Francis, Esq. 21, *Sasser-park, Epsom-park, N.W.*
- 1865 Le Feuvre, W. H., Esq., C.E. 18, *Great George-street, S.W.*
- 1861 Leckie, Patrick C., Esq. 7, *Palmer-road, Regent-park, Streatham, S.*
- 1839 Lee, Thomas, Esq. 72, *Westmoreland-street, W.*
- 1833 1140 \*Lefevre, Sir John George Shaw, M.A., D.C.L., F.R.S., Vice-Chancellor of the University of London. 8, *Spring-gardens, S.W.*
- 1853 Lettice, General John Henry, R.A., F.R.S. 10, *Latimer-Place, S.E.*
- 1862 Leggett, Clement Davidson, Esq. 43, *Lawrence-street, W.*
- 1861 Leach, Wm. John, Esq. 37, *Leicester-square, W.; and Leinster, Chelsea.*
- 1831 \*Lehmann, Frederick, Esq. 139, *Westmoreland-street, W.*
- 1845 Leigh, John Stubbis, Esq. 54, *Leinster-square, Kensington-gardens, W.*
- 1863 Le Mesurier, Henry P., Esq., C.E. 8, *St. Martin's-lane, W.*
- 1863 Le Mesurier, M.-Gen. A.P. 2, *Stratton-terrace, Hyde-park, W.*
- 1866 Lenn, Sir Charles, Bart., F.R.S., &c. *Crofton, near Farnham, Cornwall.*
- 1857 \*Lenox, George Wm., Esq. 34, *Portsmouth-street, W.; and Port-y-Prett, Glamorgan.*
- 1856 1155 Leske, the Hon. G. W. 4, *Holborn-street, W.*
- 1859 Leske, Walter D., Esq. 11, *Flora's Court, St. James's-street, S.W.*
- 1863 Lester, Dr. C. S., R.N. 8, *Chapman-place, Leicester, W.*
- 1857 L'Estrange, Carleton, Esq. *Chesham Court, S.W.*
- 1840 \*Letts, Thomas, Esq. 8, *Row of Lockman, E.C.*
- 1863 Leveaux, E. H., Esq. 25, *The Cedars, Putney, S.W.*
- 1857 Leverison, George B. C., Esq. 73, *Grimeston-terrace, Hyde-park, W.*
- 1862 Levick, Joseph, Esq. 8, *Great Winchester-street, Old Broad-street, E.C.*
- 1866 Levynge-Swift, Richard, Esq. *Levinage-lodge, Richmond, Surrey.*
- 1859 Levinson, Louis, Esq. 7, *Fincham-square, E.C.*
- 1865 1160 Lévy, Willem Hanks, Esq. *Initiation of the Association for the Welfare of the Blind, 210, Oxford-street, W.*
- 1859 Lewis, Rev. Evan, R.A. *Merchiston, Lincolshire.*
- 1852 Leicester, Captain Edmund M., R.N., Superintendent of Packets and Transports. *Albion-street, Leamington.*
- 1861 Leyland, Luke Swallow, Esq. *The Leaslands, Hethel, Doncaster.*
- 1859 Lichtfeld, Thomas George, Esq., *St. George's, St. Giles-street.*
- 1856 Lilford, Thomas Lyttleton Powys, Lord. 10, *Grosvenor-place, W.*
- 1860 Lindsay, H. Hamilton, Esq. 22, *Belknap-square, W.*
- 1857 Lindsay, Major-General the Hon. J., Grenadier Guards, M.P. 20, *Portman-square, W.*
- 1855 \*Lindsay, Wm. S., Esq. *Monmouth-street, Shepperton, Middlesex.*
- 1858 Lister, John, Esq. 24, *Leinster-terrace, Upper Hyde-park-gardens, W.*
- 1866 1170 Little, Archibald J., Esq. 34, *Brook-street, Grosvenor-square, W.*
- 1861 Lloyd, Alexander Ogilvie, Esq., M.A. *Hart's-croft, Ripley, Yorkshire.*
- 1857 \*Lloyd, George A., Esq. 2, *Road Exchange-buildings, E.C.*
- 1863 Lloyd, Sir Thomas Davis, Bart., M.P. *United University Club, S.W.; and Brownfield, Carmarthen.*

Year of  
Election.

- 1864 Lloyd, W., Esq. *Wednesbury, near Birmingham.*
- 1861 Lluellyn, Capt. Richard. 20, *Montagu-square, W.*
- 1863 Loch, George, Esq. 12, *Albemarle-street, W.*
- 1859 Loch, Henry Brougham, Esq. *Government-house, Isle of Man.*
- 1861 Loch, John Charles, Esq. 12, *Admiralty-street, W.; and Hong-Kong.*
- 1857 Loch, William Adam, Esq. 8, *Great George-street, Westminster, S.W.*
- 1864 1180 Locke, John, Esq. 83, *Adels-road, Kensington.*
- 1858 Leechant, William, Esq., F.R.C.S. *Park-place, Grosvenor-park, Blakenhall, S.E.; and Chert.*
- 1860 Lockwood, James Alfred. *United Arts Club, Grosvenor-square, W.*
- 1856 \*Logan, Sir William Edmund, F.R.S. *Montagu, Chert.*
- 1860 Londesborough, Wm. Henry Forster, Esq. *Thomas's-hotel, 25, Berkeley-sq., W.*
- 1836 Long, George, Esq., M.A. 22, *Buckingham-street, Brighton.*
- 1839 \*Long, Henry L., Esq. *Travellers' Club, S.W.; and Hampton-lodge, Farnham, Surrey.*
- 1857 \*Long, W. Beeston, Esq.
- 1858 Longlen, Marcell D., Esq. 4, *Leinster-place, Hyde-park, S.W.*
- 1865 \*Longley, Major, George, R.E. *Leinster Palace.*
- 1847 1190 Longman, Thos., Esq. *Peterborough, L.C.; and S. Sussex-st., Hyde-park, W.*
- 1858 Longman, William, Esq. 33, *Hyde-park-square, W.*
- 1861 Lonsdale, Arthur Pemberton, Esq.
- 1860 Looker, William Robert, Esq. *Melbourne, Australia; care of Mr. Ashurst 16, Bishopsgate-street-within, L.C.*
- 1861 Lorimer, George B., Esq.
- 1863 Lovell, Capt. 6, *Grosvenor-park, Blakenhall, S.E.*
- 1856 Lovett, Phillips Cosby, Esq. *Liscombe-ho., Liscombe, Leighton Buzzard, Bucks.*
- 1867 Low, Alex. F., Esq. 84, *Westbourne-terrace, W.*
- 1861 Low, Robert, Esq. 17, *Woburn-square, W.C.*
- 1863 Low, S. P., Esq. 55, *Portico-street, S.W.*
- 1858 1200 Lowden, Rev. George Rouse. *Brentville, Haverhill, Middlesex.*
- 1859 Lowe, Capt. W. Drury. *Myra, Belts-sq-Club, Llanwrst, North Wales.*
- 1863 Lowndes, E. C., Esq. 84, *Eden-place, S.W.*
- 1830 Lowry, Joseph Wilson, Esq. 45, *Robert-street, Haverhill-road, N.W.*
- 1860 Loyd, Col. W. K. *Union Club, S.W.*
- 1866 Luad, Wm. Charles, Esq. *Leinster-place, Chert.; and Athenæum Club, S.W.*
- 1860 Luke, William, Esq., Bengal Civil Service. 93, *Innermost-terr., Hyde-park, W.*
- 1860 Lumden, Rev. Robert Comyn, M.A. *Chert., Manchester.*
- 1860 Lush, Robert, Esq., C.C. *Diamond-house, Alders-road, Portul-sq-ark, N.W.*
- 1866 Lydall, J. H., Esq. 12, *Southampton-street, Chert., Chert., W.C.*
- 1830 1210 \*Lyell, Sir Charles, Bart., M.A., LL.D., F.R.S. 53, *Harley-st., Cavendish-sq., W.*
- 1837 \*Lynch, Capt. H. Blossie, I.S., C.B., F.R.A.S. *Athenæum Club, S.W.*
- 1861 \*Lynch, Thomas Keir, Esq. 31, *Chesham-square, Hyde-park, W.*
- 1858 Lyne, Francis, Esq.
- 1862 Lyon, David, Esq. 31, *South-street, Portland, W.*

Year of  
Election

- 1862 \*Macarthur, Major-Gen. Sir Edward, K.C.B. 27, *Prince's-Judges*, W.
- 1863 Macchane, James, Esq. *Bro Imadras, Deewal-on-Torah*.
- 1864 Macdon J.L. Chessborough C., Esq. 32, *Belvedere, Hampstead*, N.W.
- 1863 Macdonald, Duncan George Esq., Esq., C.I.
- 1843 Macdonnell, Sir Richard G. Bart., late Governor of S. Australia.
- 1863 1225 Macdunn, George, Esq. *Chesham, Bucks*, N.W.
- 1865 Macdunn, John G., Esq. *Chesham, Bucks*, N.W.
- 1867 Macdonald, M. Esq. *Chesham, Bucks*.
- 1869 Macdonald, Robert, Esq. *Chesham, Bucks*.
- 1861 Macdonald, Alexander, Esq. *Chesham, Bucks*.
- 1845 \*Macintyre, Patrick, Esq., F.R.S., Ord. Assoc. Inst. Act.
- 1859 Mackay, Rev. Alexander, A.M. *Chesham, Bucks*.
- 1860 Mackay, Thomas Miller, Esq. 24, *Leicester-Judges, Leicester*, W.
- 1859 \*Mackay, Thos. W. Esq. 24, *Leicester-Judges, Leicester*, W.
- 1862 Mackenzie, Colin J., Esq. *Chesham, Bucks*, S.W.
- 1845 1230 Mackenzie, Right Hon. Genl., F.R.S. *Chesham, Bucks*, S.W.; and 28, *Wimpole-street*, W.
- 1861 Mackenzie, Sir James J. Bart., Esq. *Chesham, Bucks*, S.W.; and *Scotch*, *Leicester*, N.W.
- 1860 \*Mackenzie, James T., Esq. 69, *Leicester-Judges, Leicester*, W.
- 1861 Mackenzie, John H., Esq. *Chesham, Bucks*, S.W.
- 1864 \*Mackeson, Edward, Esq. 59, *Leicester-Judges, Leicester*, W.
- 1860 Mackillop, James, Esq., F.R.S. 59, *Leicester-Judges, Leicester*, W.
- 1862 Mackinly, D., Esq. *Chesham, Bucks*, W.
- 1844 Macdonald, C. D., Esq. *Chesham, Bucks, J. Chesham and Sons, 31, Abchurch-lane, E.C.*
- 1861 Mackinnon, L. Esq. *Chesham, Bucks, S.W.; and Barchin, Mill-hill, N.W.*
- 1855 Mackinnon, Wm. Alex., Esq., M.P., F.R.S. 4, *High-street, Leicester*, W.
- 1865 1240 \*Mackinnon, Wm. Esq. 15, *High-street, Leicester*.
- 1860 Mackinly, Lt-Col. Elliot, Esq. *Chesham, Bucks, S.W.; and Tottenham, N.W.*
- 1860 Macdon, William, Esq., F.R.S. 5, *Chesham, Bucks, Great Farnham*.
- 1859 Macdon, Sir Thomas. *Chesham, Bucks, J. Chesham and Sons, 31, Abchurch-lane, E.C.*
- 1859 Macdon, George, Esq. *Chesham, Bucks, S.W.; and Tottenham*.
- 1867 Macdonald, David, Esq., M.D., Member of Legion of Honour, &c. 56, *Barton-street, Leicester*, W.
- 1855 Macdon, Andrew, Esq. *Chesham, Bucks, J. Chesham and Sons, 31, Abchurch-lane, E.C.*
- 1861 Macdon, John William, Esq. 2, *Chesham, Bucks, N.W.*
- 1860 \*Macdon, Alex., Esq. 16, *Belvedere, Leicester, Leicester*, W.C.
- 1865 Mackenzie, G. W., Esq. 7, *New Bond-street, E.C.*
- 1855 1250 Macdon, John, Esq. *Fatherland, Trinity*.
- 1856 \*Macpherson, Duncan, Esq., M.D., Inspector-General of Hospitals. *Care of Messrs. Smith, Elder and Co.*
- 1861 Macpherson, William, Esq. 32, *Leicester-jate, W.*
- 1845 \*Macqueen, James, Esq., K.C. Tower and Sword of Portugal. 4, *Alma-terrace, Hammersmith*, W.

Year of Election.	
1884	Macrae, Colin W., Esq. <i>Oriental Club, Hammer-square, W.</i>
1885	Maetaggart, Malcolm, Esq. <i>Sydney, New South Wales.</i>
1883	McArthur, Alex., Esq. <i>Radclyffe-hill, Britton-rise, Britton, S.</i>
1880	McClintock, Capt. Sir Francis Leopold, R.N. <i>United Service Club, S.W.</i>
1881	*McConnell, W. R., Esq., Barrister-at-Law. 12, <i>King's-bench-walk, E.C., and Chancery-lane, E.C.</i>
1882	McDonagh, John, Esq., M.D. <i>Junior United Service Club, S.W.</i>
1885	126c McDonald, James, Esq. <i>Oriental Club, Hammer-square, W.</i>
1885	McEuen, D. P., Esq. 24, <i>Pembroke-square, Bayswater, W.</i>
1885	McEwan, James, Esq. 30, <i>Hammond-street, Kensington, W.</i>
1859	McGloth, John C., Esq. <i>Leinster Club, S.W.</i>
1855	McGregor, Duncan, Esq. <i>Boat of Trade, S.W.; and Athenaeum Club, S.W.</i>
1866	*McIlroy, W. G., Esq., Superintendent of Chaulmura Plantations. <i>Octavian-street, Dublin.</i>
1853	McKernell, Robert, Esq. 45, <i>Innerness-terrace, W.; and Mauritius.</i>
1898	McNair, Capt. John F. A., R.A. 19, <i>Abbey-gardens, St. John's-road, N.W.</i>
1855	*McNair, Captain Sir Robert J. le M., R.N. <i>Cripplegate, Herts; and Athenaeum Club, S.W.</i>
1862	McDougall, Staff-Commander Geo. Fred., R.N. <i>Hydrographic Office, Admiralty, S.W.; and 51, Oxford-street, Kensington, N.W.</i>
1852	1270 McLeod, Walter, Esq. <i>Head Master of the Royal Military Asylum, Chelsea, S.W.</i>
1839	McNeil, The Right Hon. Sir John, G.C.B. <i>Granton, near Edinburgh.</i>
1861	*McQuinn, Capt. Rochfort, R.N. <i>United Service Club, S.W.</i>
1859	Maitland, Geo. Gamble, Esq. <i>Cheltenham, Gloucestershire.</i>
1853	Majendie, Ashhurst, Esq., F.R.S. <i>Athenaeum Club, S.W.; 152, Albany-street, Regent's-park, N.W.; and Heddenham-castle, Essex.</i>
1845	*Major, Richard Henry, Esq. <i>British Museum, W.C.</i>
1858	Mallory, John Walter, Esq. 15, <i>Richmond-terrace, Seven-sisters'-rd., Holloway, N.</i>
1853	*Mallory, Thomas, Esq. 2, <i>Portobello, Seven-sisters'-road, Holloway, N.</i>
1862	*Mallory, Capt. Edward Donald, R.E. <i>Chatham.</i>
1863	Mallory, Jos., Esq. 22, <i>Prince's-gate, Kensington, W.</i>
1843	1280 *Mallory, W. L., Esq. <i>Burnfoot, Lancashire, near Carlisle.</i>
1853	*Mallet, Charles, Esq. <i>Admiralty, W.C.; and Richmond, Hampstead, N.W.</i>
1836	*Manchester, James Prince Lee, Bishop of, F.R.S., &c. <i>Athenaeum Club, S.W.; and Selwyn-hill, Manchester.</i>
1830	*Mangles, Capt. James, R.N., F.R.S. <i>Fairfield, near Exeter.</i>
1860	Mann, James Alexander, Esq., M.R.A.S. <i>Kingsgate-palace, W.</i>
1866	Mann, Robert James, Esq., M.D. 12, <i>Chesham-street, Strand, W.C.</i>
1866	Manners, Geo., Esq., F.S.A. <i>Langdon-road, Croydon.</i>
1856	Manning, Frederick, Esq. <i>Byron-lodge, Leamington; and 8, Dover-street, W.</i>
1864	*Mansell, Commander A. L. H.M.S. 'Hesperus,' <i>care of the Hydrographic Office, Admiralty, S.W.</i>
1859	Mantell, Walter Baldoek Durant, Esq. <i>Wellington, New Zealand. Care of E. Stanford, Esq.</i>

Year of Election	
1869	1290 Mariette, Prof. Alphonse, M.A. 27, <i>St. Stephen's-square, Bayswater, W.</i>
1870	*Marjoribanks, Edward, Esq. 34, <i>Wimpole-street, W.</i>
1874	Marshall, Clements Robert, Esq. <i>In the Office, S.W.; and</i> 21, <i>Leek-street, S.W.</i>
1877	Mulhough, George, Esq. <i>Belvidere, Woodstock-Circus of E. Stamford, Esq.</i>
1874	Marsden, Rev. J. H. <i>at the Office, near Horse-ch., E.C.</i>
1877	Marsh, Matthew Henry, Esq., M.P. <i>at the Royal College Club, S.W.; and</i> 41, <i>Rutland-place, S.W.</i>
1862	Marshall, Capt. J. G. Don 46, <i>Gloucester-square, Hyde-park, W.</i>
1854	Marshall, Jas. Garth, Esq. <i>at the Office, near Leek-street; and</i> Mont. Cruxton, <i>Amblecote.</i>
1862	Marshall, William, Esq. 4, <i>Poppleton-street, Inner Temple, E.C.</i>
1859	*Marsham, the Hon. Robert. <i>at the Office, Horse-ch., E.C.</i>
1857	1320 Mashman, J. C., Esq. 7, <i>Kensington-park-terrace, W.</i>
1867	Martini, Guillermo E. de, Com. General United States of Columbia. 13, <i>Bessborough-street, Piccadilly, S.W.</i>
1857	Martin, Francis P. D., Esq.
1861	Martin, Henry, Esq. <i>at the Office, near Horse-ch., E.C.</i>
1850	*Martin, Richard Biddulph, Esq. <i>at the Office, near Horse-ch., E.C.</i>
1862	Martin, Thomas, Esq. 5, <i>Compton-terrace, S.W.</i>
1865	Masruron, Wm. R., Esq.
1845	*Matheson, Sir James, Bart., M.P., F.R.S. 13, <i>Chesham-street, S.W.; and</i> <i>at the Office, near Horse-ch., E.C.</i>
1858	Matheson, James Edwin, Esq. 77, <i>Long-street, E.C.; and</i> 16, <i>Queen's-gate, Bayswater, W.</i>
1866	Maudslayi, Henry, Esq. 110, <i>Westminster-bridge-road, S.</i>
1860	1315 *Maxwell, Sir William, Bart., M.P. 128, <i>Park-street, Grosvenor-square, W.</i>
1855	May, Daniel John, Esq., R.N. <i>at the Office of the Admiralty, Whitehall, W.</i>
1858	Mayer, Joseph, Esq., F.R.S. 28, <i>Long-street, E.C.</i>
1861	Mayer, William S. F., Esq., Interpreter to H.M. Consulate. <i>at the Office of F. J. Austin, Esq., 12, Grosvenor-street, E.C.</i>
1862	Mayne, Captain Richard Charles, R.N. <i>H.M.S. 'Eclipse;' and</i> 80, <i>Chester-square, S.W.</i>
1858	Mayo, Capt. John Pole. <i>at the Office, near Horse-ch., E.C.</i>
1863	Meade, the Hon. Robert Henry. <i>at the Office, near Horse-ch., E.C.; and</i> 3, <i>Belgrave-square, S.W.</i>
1862	*Medley, Lieut. Melvyn B., R.N. <i>at the Office, near Horse-ch., E.C.</i>
1860	*Memertshagen, Daniel, Esq. 10, <i>Moorgate-street, E.C.; and</i> 28, <i>Deans-road, E.C.</i>
1865	Mellie, Charles James, Esq., M.D. 48, <i>Queen Anne-street, Coventry-square, W.</i>
1854	1320 Melvill, Col. Sir Peter Melvill, Mil. Sec. to the Bombay Gov. 27, <i>Falmouth-square, Brighton.</i>
1838	Melville, Philip, Esq., F.R.S. <i>at the Office, near Horse-ch., E.C.</i>
1863	Mercier, Rev. J. J. <i>at the Office, near Horse-ch., E.C.</i>
1842	*Merrivale, Herman, Esq., C.B., Under Sec. of State for India. <i>at the Office, near Horse-ch., E.C.; and</i> 23, <i>Westbourne-terrace, W.</i>
1866	Mesurier, Charles A., Esq. <i>at the Office, near Horse-ch., E.C.</i>

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- 1837 \*Moxborough, John Chas. Geo. Esq. of. 33, *Fower-street, W.; and Methley-park, near Leeds.*
- 1865 \*Mitchell, Lieut.-Colonel J. E., R.M.A.
- 1860 Michell, Thomas, Esq. *St. Peter-bury.*
- 1863 \*Miche, A., Esq. 26, *Austen-Francis, E.C.*
- 1848 Middleton, Rear-Admiral Sir G.N. Broke, Bart., *H.M.S. 'Hero,' Sheerness; and Brocks-hall, Suffolk.*
- 1859 1330 Miland, John, Esq. *Cliff-hill, Lonsdale-road, Wimbeldon.*
- 1866 Milbrey, Capt. Herbert St. John Rifle Brigade. 19, *Charles-street, Berkeley-square, W.*
- 1866 Miles, John George, Esq. 4, *Stationers' Hall-court, Ludgate-hill, E.C.*
- 1860 Miles, Rev. R. *Emphm, Notts.*
- 1861 Miller, George T., Esq. 59, *Portland-place, W.*
- 1861 \*Miller, Commander Henry Matthew, R.N. *The Grove, Esher; and Junior United Service Club, S.W.*
- 1853 \*Miller, Capt. Thos., R.N. *H.M.S. 'Royal George' and United Service Club, S.W.*
- 1861 Millan, Joseph, Esq. 15, *Northumberland-street, W.C.*
- 1857 Mills, Arthur, Esq. 34, *Hyde-park-parkings, W.*
- 1863 \*Mills, John R., Esq. M.P. *Kingswood-lodge, Enghfield-green.*
- 1864 1340 Mills, Rev. John. 40, *Lonsdale-square, N.*
- 1863 \*Milton, Viscount, M.P. 4, *Grosvenor-square, W.*
- 1869 Milman, Capt. Everard, Mulus Horse Artillery. 9, *Berkeley-square, W.*
- 1866 Milne, Vice-Adml. Sir Alex., K.C.B. *United Service Club, S.W.*
- 1860 Mitchell, Capt. Alexander, M.P. 6, *Great Strand-post-office, Park-lane, W.*
- 1862 \*Mitchell, George, Esq. 22, *Bolton-street, Piccadilly, W.*
- 1864 Mitchell, J. W., Esq. *Mansfield, Woodhouse, Notts.*
- 1864 Mitchell, Thomas, Esq., C.E. *Oldham.*
- 1859 Mitchell, William, Esq. 54, *Gracechurch-street, E.C.; and 6, Hyde-park-gate, Kensington-gore, W.*
- 1865 Mitchell, Wm. H., Esq. *Junior Carlton Club, S.W.*
- 1851 1350 \*Mocatta, Frederick D., Esq. 35, *Gloucester-place, Portman-square, W.*
- 1853 Moffatt, George, Esq., M.P. 103, *Tuton-square, S.W.*
- 1861 Mollison, Alexander Fullerton, Esq. 10, *Landon-terrace, Notting-hill, W.*
- 1861 Money, Lieut.-Col. George Henry. 9, *Berkeley-street, W.*
- 1842 \*Montagu, Major Willoughby. *Clapham-common, S.*
- 1862 \*Montague, Capt. Horace. 24, *Cowpel-street, Park-lane, W.*
- 1830 \*Montefiore, Sir Moses, Bart., F.R.S., F.R.S.N.A. 7, *Grosvenor-gate, Park-lane, W.; and East-Rif-lodge, Rums-pole.*
- 1859 Montomerie, F. Butler, Esq. 2, *Cleveland-street, St. James's, S.W.; and St. Leonard's-street.*
- 1859 Montomerie, Capt. T. G., Engin., 1st Assist. Trig. Survey. *Care of Messrs. Alexander Dickson & Co. 10, Kings-cross-yard, Moyle-street, E.C.*
- 1860 Montgomery, Robert Mortimer, Esq. 16, *Uster-place, Regent's-park, N.W.*
- 1865 1360 Montgomery, Sir Robert, K.C.B. 7, *Cornwall-jardons, Queen's-gate, W.*

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- 1839 Moody, Lieut.-Colonel R. C., R.E. *British Chamber. One of R. Smith, Esq., Solicitor.* W.
- 1861 Moon, Rev. Edward Graham. *Fitcham, Surrey.*
- 1857 \*Moor, Rev. Allen P., M.A., F.R.A.S. *St. Augustine College, Canterbury.*
- 1863 Moore, H. Byron, Esq. *Society Office, Melbourne, Australia.*
- 1861 Moore, John Carrick, Esq. *Cowesall, Wiltshire; Geological Society, W.C.; and 23, Bolton-court, W.*
- 1857 Moore, Major-General W. Y. *United Service Club, S.W.*
- 1863 More, R. Jasper, Esq., M.P. *Lincoln, Shop.*
- 1864 Morgan, D. L., Esq. *H.M.S. 'Euryalus.'*
- 1861 Morgan, Julius Spencer, Esq. 13, *Princes-street, H. de-ville, W.*
- 1861 1370 Morgan, William, Esq., R.N. 15, *Palmerston, Farnborough, Ipswich.*
- 1839 \*Morris, Charles, Esq. *University Club, S.W.*
- 1866 Morris, Herbert Henry, Esq. 9, *Co. de-ville-street, S.W.; and 6, Clarence-park, South-east, Hants.*
- 1861 Morrison, Captain Peter.
- 1863 Morrison, Col. J. D. 7, *Albion-street, W.*
- 1855 Morson, T., Esq. 124, *Southampton-street, Russell-street, W.C.*
- 1861 \*Mout, Frederick J., Esq., M.D., Surgeon-Major and Inspector-General of Prisons, Bengal Army, &c. *Albion-street, S.W.; and 45, Abchurch-lane, North-east, W.C. One of Messrs. A.C. Leper & Co., 1, White-church-st., Fleet-st., L.C.*
- 1858 Mudie, Charles Edward, Esq. *The Green, Harington, N.W.*
- 1858 Mudler, Ferdinand, Esq., M.D., PH. DR. *Director of the Botanical Gardens, Melbourne. One of Messrs. Deben and Co., 27, Soho-square, W.*
- 1862 Muir, Francis, Esq., LL.D.
- 1855 1380 Muir, Thomas, Esq. 24, *York-terrace, Lieutant's-park, N.W.*
- 1866 Mundella, A. J., Esq. *Nottingham.*
- 1863 \*Murchison, John H., Esq. *Sorbilton-hill, Kingston-on-Thames; and Junior Carlton Club, S.W.*
- 1859 Murchison, Kenneth R., Esq. *Manor-house, Bathford, Bath.*
- 1830 \*Murchison, Sir Roderick Imprey, Bt. K.C.B., G.C.S.R.A., M.A., D.C.L., V.P.R.S.G.S., and L.S., Director-General of the Geological Survey of Great Britain and Ireland, Trust. Brit. Mus., Hon. Mem. R.S. of Ed., R.I.A., Mem. Acad. St. Petersburg, Berlin, Stockholm, Brussels, and Copenhagen, Corr. Ins. Fr., etc. etc. 16, *Belgrave-square, S.W.; and 28, Jernyngham-street, S.W.*
- 1864 Murchison, Capt. R. M. *Guy-street, Bath.*
- 1830 \*Murdock, Thomas W. C., Esq. 8, *Park-street, Westminster, S.W.; and Race-bank, Portney, S.W.*
- 1860 Murray, George J., Esq. *Hol-cottage, Hornsea; and Jun. Carlton Club, S.W.*
- 1844 \*Murray, James, Esq. *Foreign Office, S.W.*
- 1850 Murray, John, Esq. 50, *Abchurch-lane, W.; and Newstead, Wembley, S.W.*
- 1860 1390 \*Murray, Lt. W., 68th Brig. N. Ind. Topo. Assist. G. Trig. Survey. *Mussorie, India. Messrs. Smith, Elder and Co.*
- 1865 Mussey, H. G. de, Esq., M.D. 4, *Chandish-place, W.*



Year of Election	
1865	Nairne, P. A., Esq. 2, <i>Grove-hill, Cumberland, S.</i>
1853	Napier, Maj.-General Geo. Thomas Conolly, C.B. <i>Jun. United Service Club, S.W.</i> <i>Care of Sir J. Ker, Edinburgh.</i>
1861	Napier, William, Esq. <i>St. Martin's-church, Ipswich.</i>
1857	Napier, Hon. William. 54, <i>Green-street, Grosvenor-square, W.</i>
1859	*Nasmith, Capt. David J., 1st Assist. Trigonometrical Survey. <i>Bhoop, Bombay.</i> 5, <i>Charlotte-street, Edinburgh.</i>
1861	Neave, Sir Richard Digby, Bart. <i>Tinnellers' Club, S.W.</i> ; 78, <i>Eccleston-square,</i> <i>S.W.</i> ; and <i>Deputes-park, Romford, Essex.</i>
1857	*Nesbitt, Henry, Esq. 6, <i>The Terrace, South Hackney, N.E.</i>
1856	Newman, Thomas Holdsworth, Esq. 43, <i>Green-street, Grosvenor-square, W.</i>
1866	1420 Nicol, James D., Esq., M.P. 13, <i>Hyde-park-place, Cumberland-pk., W.</i>
1856	Nicholson, Sir Charles, Bart., D.C.L., Chancellor of the University, Sydney. 26, <i>Leicester-square, London-pk., W.</i>
1865	*Nichols, Robert C., Esq. 5, <i>Westbourne-park-place, W.</i>
1836	Nicolson, Rear-Admiral Sir Frederick Win. Easme, Bart. 15, <i>William-street,</i> <i>London-square.</i>
1864	Nissen, H. A., Esq. <i>Mark-lane, E.C.</i>
1858	Nix, John H., Esq. 77, <i>Lombard-street, E.C.</i>
1861	Noel, the Hon. Roden. 11, <i>Chandos-street, Cavendish-square, W.</i> ; and <i>Easton-hall, Orkney, Rutlandshire.</i>
1857	*Nolloth, Captain Matthew S., R.N. <i>Hong-Kong: United Service Club, S.W.</i> and <i>St. Mary's-church, Penang, S.E.</i>
1865	Norman, H. J., Esq. <i>Bonhill, Common, Kent.</i>
1860	Normis Harry, Esq. <i>Colindale Ave., S.W.</i> ; and 4, <i>Little St. James's-street, S.W.</i>
1861	1410 North, Alfred, Esq. 20, <i>Royal York-rows out, Clifton, Bristol.</i>
1856	North, Frederic, Esq. 3, <i>Victoria-street, Finsbury, S.W.</i> ; and <i>Hastings-lodge,</i> <i>Hastings.</i>
1832	Notman, Henry Wilkes, Esq. 7, <i>Great Marlborough-street, W.</i>
1862	Nourse, Henry, Esq. <i>Conservative Club, S.W.</i>
1858	*Oakeley, R. Banner, Esq. <i>Oswaldkirk-hall, Yorkshire.</i>
1863	O'Callaghan, Chas., Esq., Staff Surgeon. <i>Kilmerney, Ireland.</i>
1856	O'Connor, Col. Luke Smyth, C.B., late Governor of the Gambia. <i>U.S. Club, S.W.</i>
1858	Ogilvie, Edward D., Esq. <i>Ynllillar, Clarence-river, New South Wales.</i> <i>Care</i> <i>of Messrs. Morrett and Sons, London &amp; Portland, E.C.</i>
1863	Ogilvy, Col. Thos. 23, <i>Grafton-st., London, W.</i> ; and <i>Rathen, Forfarshire, N.B.</i>
1864	Ogilvy, Thos., Esq. 62, <i>Princes-pk., Hyde-park, W.</i>
1859	1425 Ogile, John W., Esq., M.D. 13, <i>Upper Brook-street, W.</i>
1831	Oldershaw, Capt. Robert Prescott. 71, <i>Wentworth-square, Belgrave-st., S.W.</i>
1855	Oliphant, Laurence, Esq., M.P. <i>Academy Club, S.W.</i>
1861	Oliphant-Ferguson, G. H., Esq. <i>Broadfield-house, Carlisle.</i>

Year of Election	
1836	Oliver, Lieut. S. P., 12th Brigade R.A. 1, <i>Buckingham Palace, Whitehall, and Horse Guards, W.C.</i>
1845	*Ommauney, A. M., Esq., F.R.S., F.R.A.S. 6, <i>Trafalgar Square, Hyde Park, W.; and United Service Club, S.W.</i>
1838	*Ommauney, H. M., Esq. <i>Belgrave, S.E.</i>
1834	O'Reilly, E., Esq.
1853	Osborn, Sir George R., Bart., <i>Travellers' Club, S.W.; and Chelsea Club, S.W.</i>
1856	Osborn, Capt. Sherard, R.N., C.B., Officier de Légion d'Honneur, etc. <i>Athenæum Club, S.W.; and Earl's Court, S.E.</i>
1831	1435 Osborn, Capt. Wilmot. <i>Portland, Dorset, S.W.; and Whitehall, W.C.</i>
1834	Osborn, Samuel Esq., M.D. 19, <i>Manor House, Putney, S.</i>
1852	Oswell, William Cotton, Esq.
1855	Otway, Arthur John, Esq., M.P. <i>Army and Navy Club, S.W.</i>
1830	*Overy-North, the Rev. J. <i>East Acton, Middlesex, W.</i>
1844	*Overstone, Samuel, Lord, M.A., M.R.I. 2, <i>Carlton Gardens, S.W.; and Whitehall, W.C.</i>
1867	Owen, Chas. Lanyon, Esq. Lieut. and Adj. R. M. Light Inf., Portsmouth Division. <i>Gloucester, Bath, and Oxford, W.C.</i>
1865	Owen, H. Bannard, Esq. 29, <i>Great Street, Bedford Square, W.C.</i>
1846	*Oxford, Rt. Rev. Samuel Wilberforce, Bishop of, F.R.S., F.S.A. 26, <i>Pall Mall, S.W.; Church Lane, W.C.; Oxford, W.C.; and Kingston, Sussex.</i>
1861	Page, Thomas, Esq., C.E., F.G.S. 3, <i>Adelphi Terrace, W.C.; and Tower Cross, Whitehall, W.C.</i>
1853	1442 Pilkington, Right Hon. Sir John Somerset, Bart., M.P. 41, <i>Eaton Square, S.W.; and Westwood Park, Droitwich, Worcestershire.</i>
1856	Palliser, Captain John. <i>Connaught, Kilmacton, Wexford; and National Club, Whitehall Gardens, S.W.</i>
1855	Palmer, Major Edm., R.A. <i>Bookham, Surrey, S.W.</i>
1865	*Palmer, Commander George, R.N. <i>Chester, W.C.; and London, S.W.</i>
1862	Palmer, Rev. Jordan, M.A., F.S.A., Chaplain to St. Ann's Royal Society. <i>St. Catharine, S.W.</i>
1838	*Palmer, Samuel, Esq.
1865	*Papworth, Oswald C., Esq., C.L. 46, <i>Russell Square, W.C.</i>
1863	*Parr, H.R.H. Le Comte de. <i>Chancery, W.C.</i>
1839	*Parish, Capt. John E., R.N. <i>Army and Navy Club, S.W. Care of Messrs. St. John, S.W.</i>
1833	*Parish, Sir Woodbine, K.C.H., F.R.S., &c. <i>Overbury House, St. James's Park, S.W.</i>
1864	1455 Parish, Capt. A. <i>Chancery, W.C.</i>
1866	Parker, Capt. Francis G. S. <i>St. John's, W.C.</i>
1862	Parker, Henry T., Esq. 3, <i>Leicester Square, W.C.</i>
1862	Parker, Robert Dene, Esq. <i>Union Club, S.W.; and Brompton, S.W.</i>
1850	Parker, Sir Harry S., C.B., &c. <i>Oriental Club, W.C.; and Athenæum Club, S.W.</i>
1850	*Parkyns, Mansfield, Esq., F.Z.S. <i>Arthur's Club, St. James's Street, S.W.; and Woodborough Hall, Southwark.</i>

Year of Election	
1859	Pasteur, Marc Henry, Esq. 28, <i>Minerva-street, E.C.</i>
1857	Paton, Andrew A., Esq. <i>H.B.M.'s Consul, Missolonghi, Greece.</i>
1863	Pattinson, J., Esq. 21, <i>Druid-street, E.C.</i>
1858	Paul, Joseph, Esq. <i>Oranville-house, Pado, Isle of Wight.</i>
1865	146c Payne, J. Bertrand, Esq., M.R.S., F.R.S., Mem. Geograph. Soc. of France. <i>Temple-houses, Fetter-lodge, St. Kensington, W.; and Conservative Club, S.W.</i>
1847	*Paynter, William, Esq., F.R.A.S. 21, <i>Belgrave-square, S.W.; and Comberne-house, Richmond, Surrey, S.W.</i>
1855	Peabody, George, Esq. 22, <i>Old Broad-street, E.C.</i>
1853	Peacock, George, Esq. <i>St. Andrew, near Leicester.</i>
1863	Pease, Capt. R. B., R.N. <i>Arthur's Cl.</i>
1863	Peason, Fred., Esq. 13, <i>Chesham-lane, W.</i>
1853	*Peckover, Alexander, Esq. <i>Walsby.</i>
1860	*Peck, Henry William, Esq. <i>Wimbledon-house, S.W.</i>
1861	Peel, Archibald, Esq.
1853	Peel, Sir Robert, Bart., M.P. 4, <i>Whitehall-gardens, S.W.; and Dryton-moor, Tynemouth.</i>
1859	147c *Pennant, George Sholto Douglas, Esq. <i>Pearbroke-stile, Bangor.</i>
1863	*Pennant, Col. S. S. Douglas. <i>Pearbroke-stile, Bangor, N.B.</i>
1853	Percy, Colonel the Hon. Lord Henry M. (Glands). <i>Northwick-lamb-house.</i>
1865	Percy, the Earl. <i>Portman-square; and Northwick-lamb-house.</i>
1865	Perena, Francisco E., Esq. <i>Care of Messrs. De la Roche, 13, Pall mall.</i>
1865	Perkes, Samuel, Esq., late Hon. C.I.C.S., Bombay, F.R.S., F.Z.S., M.S.A., &c. 72, <i>Coventry, E.C.; and Brough-house, West Dore, S.</i>
1860	Perkins, Frederick, Esq. <i>Mayor of Southampton.</i>
1865	Perkins, William, Esq. <i>Lisbon, Argentine Republic. Care of W. Holbeck, Esq.</i>
1860	Perowne, Rev. J. J. Stewart. <i>Principal and Hebrew Lecturer, St. David's College, Lampeter, S. Wales.</i>
1859	Perry, Sir Erskine, Member Indian Council. 36, <i>Eaton-place, S.W.</i>
1859	148c Perry, William, Esq., H.B.M.'s Consul, Panama. <i>Athenium Club, S.W.</i>
1862	*Perry, William, Esq. 9, <i>Warwick-road, Upper Clapton, N.E.</i>
1865	Perry, G. R., Esq., H.B.M.'s Consul. <i>Launceston Sq. Bristol.</i>
1862	Peter, John, Esq.
1857	*Peters, William, Esq. 35, <i>Nicholson-lane, Lambeth-street, E.C.</i>
1860	Petherick, John, Esq. <i>Henley-on-Thames.</i>
1858	Peto, Sir S. Morton, Bart., M.P. 12, <i>Kensington-park-terrace, W.</i>
1861	Petrie, Alexander S., Esq. 4, <i>St. Mark's-square, N.W.</i>
1860	Petrie, Captain Martin, 14th Regiment. <i>Honour-odd-st, Kensington-park, W.</i>
1862	Peyton, Col. John L. 93, <i>Great Russell-st. Bloomsbury, W.C.</i>
1866	149c Phanazyn, Robert, Esq. <i>Wellington, New Zealand.</i>
1861	Philips, William, Esq. 18, <i>Montpelier, Kensington, W.C.</i>
1862	Phené, John Samuel, Esq. 34, <i>Olding-street, Chelsea, S.W.</i>
1830	Philip, George, Esq. 32, <i>Fleet-street, E.C.</i>
1865	Philipps, Edward B., Esq. 105, <i>Onslow-square, S.W.</i>

Year of  
Election.

- 1857 Phillimore, Capt. Augustus, R.N. 25, *Upper Portland-street, W.; and U. S. Club, S.W.*
- 1859 Phillimore, Chas. Robert, Esq. 1, *Belgrave, S.W.; and 25, Upper Belgrave-st., W.*
- 1861 Phillimore, Sir Robert. 5, *Admiralty-street, S.W.*
- 1860 Phillimore, Wm. Bragdon, Esq., late Capt. Grenadier Guards. 5, *John-street, Belgrave, S.W.*
- 1859 \*Phillips, Sir Thomas, Bart., M.A., F.R.S., F.S.A. *Albion Club, S.W.; and Marlborough, Wiltshire.*
- 1854 1505 Phillips, Major-General Sir B. Travers. *United Service Club, S.W.*
- 1853 Phillips, John, Esq., Solicitor. *Holborn.*
- 1864 \*Pigou, F. A. P., Esq. *Dorset, Kent.*
- 1865 Pigou, Rev. F., M.A. 14, *St. Martin's-street, Pall Mall East, S.W.*
- 1861 Pike, Frederick, Esq. 44, *Chancery-lane, S.W.*
- 1852 \*Pike, Commander John W., R.N. 26, *Old Burlington-street, W.; Junior United Service Club, S.W.*
- 1853 Pilkington, James, Esq. *Reform Club, S.W.; and Blackburn.*
- 1851 \*Pin, Commander Leslie C. T., R.N. *Bell-street, Hampstead, N.W.; and Senior and Junior United Service Clubs, S.W.*
- 1853 Pinott, James, Esq. *University College, London, W.C.; and Christ Church, 10, *Belgrave, Belgrave-st., S.**
- 1859 Pinney, Colonel William. 30, *Belgrave-square, W.*
- 1865 1512 Playfair, John, Esq. 36, *Georgestreet, Edinburgh, Birmingham.*
- 1860 Playfair, Lieut.-Col. Robert Lambert. *Public Agent, Zanzibar, Messrs. S. & L. Baker, and Co., 45, Pall Mall.*
- 1863 Plowden, Charles, C., Esq. 15, *Fork-street, Portman-square, W.*
- 1856 \*Plowes, John Henry, Esq. 39, *Fork-terrace, Regent's-park, N.W.*
- 1855 \*Pollock, Capt. J. J. *Idem.*
- 1856 \*Pollock, Jno. Horace, Viscount. 13, *Down-street, W.*
- 1853 Pollock, General Sir George, G.C.B. *Clapham Common, Surrey, S.*
- 1855 \*Ponsonby, Hon. Frederick G. B. 3, *Mount-street, Grosvenor-square, W.*
- 1860 Pook, Captain John. 6, *Colfe's-buildings, Leinster-hall, S.E.*
- 1857 Pope, Captain Wm. Agnew. 52, *Charles-street, Portico-square, W.*
- 1863 1523 \*Porcher, Commander Edwin A., R.N. 50, *Montagu-square, W.*
- 1853 Porter, Edwd., Esq. *Albion Club, S.W.; and 26, St. John's-street, Pall Mall, S.W.*
- 1864 Portugal, Chev. Joaquim de.
- 1867 Potter, Wm. Henry, Esq. *Dunsden-lodge, Sonning, near Reading.*
- 1861 \*Poulton, Captain Lonsdale. *Junior United Service Club, S.W.; and Brunswick-road, Co. Wexford.*
- 1862 Povah, Rev. John V., M.A. 11, *Ladbroke-street, W.C.*
- 1864 \*Powell, F. S., Esq., M.P. 1, *Curthorpe-square, Hyde-park, W.*
- 1859 Power, E. Rawdon, Esq. *and Service Club, St. James-street, S.W.; and Belgrave-hall, Kent, S.E.*
- 1854 Power, John, Esq. 3, *College-terrace, Cambridge-road, Hammersmith, W.*
- 1854 Power, John Arthur, Esq., M.A., R.M. 52, *Durton-crescent, W.C.*

Year of  
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- 1854 1530 Powys, the Hon. E. R.  
 1864 Powys, Hon. Leopold. 17, *Montagu-street Portman-square, W.*  
 1864 Powys, Hon. C. J. F. *Bury's Mounting.*  
 1853 Price, Jas., Esq., M.D., F.R.C.S., &c. *Brixton, Surrey, S.*  
 1852 Price, James Gleme, Esq., Barrister-at-Law 14, *Clement's-inn, W.C.*  
 1860 \*Pickett, Rev. Thomas William, M.A., F.S.A. 15, *Corne all-jardens, Queen's-gate, W.*  
 1865 \*Pringle, A. Esq. *Fair, S. Kensington, N.W.*  
 1855 \*Pringle, Thomas Young, Esq. *Reform Club, S.W.*  
 1866 \*Prinsep, Ltw. Angl., Esq., B.C.S. Commissioner of Settlements in the Punjab. *Untar. Care of Messrs. Smith, E. & Co., 65, Colindale, E.C.*  
 1845 Prinsep, Henry T., Esq. *Little Holland-house, Kensington, W.*  
 1831 1540 \*Prodgers, Rev. Edwin. *The Rectory, Abbott St. Peter's, Herts.*  
 1852 Prout, John William, Esq., M.A., Barrister-at-Law. *Athenium Club, S.W. and New Inn, Middlesex, N.W.*  
 1862 \*Puget, Major J. *8th Hussars, Aldershot.*  
 1860 Puller, Arthur Giles, Esq. *Athenium Club, S.W.; Arthur's Club, S.W.; and Fennyburgh, Ware.*  
 1857 Puncell, Edward, Esq., LL.D. 2, *Mace-hill, Greenwich, S.E.*
- 1864 Quicke, W. F., Esq. *King's Lodge College, High-street, Exeter.*  
 1861 Quin, Lord George. 15, *Belgrave-square, S.W.*  
 1862 Quin, John Thos., Esq. *Care of Mr. Lambson, Epsom.*  
 1854 \*Quin, Admiral Michael. *Senior United Service Club, S.W.; and 18, Albion-cullos, Action-road, Islington, N.*
- 1853 \*Radstock, Garville Augustus, Lord. 30, *Draynton-square, W.*  
 1832 1550 Rae, James, Esq. 32, *Phillimore-jardens, Kensington, W.*  
 1853 Rae, John, Esq., M.D. *Bustone-house, Kew-hill, Orkney; and 4, Fenchurch-street, E.C.*  
 1866 Ramsay, Alex., Jun., Esq. 45, *Norland-square, Notting-hill, W.*  
 1851 \*Ramsay, Rear-Admiral Wm., C.D., F.R.A.S. *Junior United Service Club, S.W.; and 23, Ainslie-place, Edinburgh.*  
 1866 Ransom, Edwin, Esq. *Kensington, near Bedford.*  
 1854 Ranyard, A. C., Esq. 13, *Hunter-street, W.C.*  
 1862 Rasch, F., Esq. 30, *Cambridge-square, Hyde-park, W.*  
 1859 Ratcliff, Charles, Esq., F.S.A. *National Club, S.W.; Edgbaston, Birmingham, and Downing College, Cambridge.*  
 1861 Rate, Lachlan Macintosh, Esq. 9, *South Audley-street, W.*  
 1846 Ravenshaw, E. C., Esq., M.R.A.S. *Oriental Club, W.; and 3, Eaton-sq., W.*  
 1859 1560 Ravenstein, Ernest G., Esq. *Topographical Depot, Spring-jardens, S.W.*  
 1865 Rawlings, Thos., Esq. *Hampton-villa, Penbridge-place, Bayswater, W.*

Year of  
Election

- 1831 Rawlinson, Sir Christopher. *United University Club, S.W.*
- 1844 \*Rawlinson, Maj.-General Sir Henry C., M.P., K.C.B., D.C.L., F.R.S. *Atterham Club, S.W.; and 1, Hill-street, Berkeley-square, W.*
- 1838 Rawson, His Excellency Rawson Wm., C.B., Colonial Secretary. *Bathons.*
- 1866 Ray, W. H., Esq. *Tottenham, E.sq.*
- 1863 Reele, W. Whitwode, Esq. *Conservative Club.*
- 1865 Redford, R. Milne, Esq. *Swanwick, S.W.; and 1, Moulton-street; Conservative Club, S.W.; and 1, Moulton-street, S.W.*
- 1857 Reel, William, Esq. *1, Moulton-street, Kensington, W.*
- 1861 \*Reid, David, Esq. 95, *Princes-street, W.*
- 1858 1570 Rees, I. E. R., Esq. *1, Moulton-street, Messrs. Horsburgh and Co., 16, Minerva-lane, E.C.*
- 1859 Reeve, John, Esq. *Conservative Club, S.W.*
- 1866 \*Reid, George, Esq. 9, *Great Trow-street, E.C.*
- 1856 Reid, Henry Stewart, Esq. *Beard and Son, Messrs. Smith, Elder and Co.*
- 1857 Reid, Leitch, Esq. *1, Moulton-street, S.W.; and 122, Westmore-street, W.*
- 1861 Reid, Wilton, Esq., C.B. 27, *Chesham-street, Harcourt-hall, N.W.*
- 1861 Reilly, Anthony Adams, Esq. *Belmont, M.C.*
- 1830 \*Renne, Sir John, C.B., F.R.S., F.S.A. *Cave of — Renne, Esq., Mure-court-chambers, Temple, W.C.*
- 1866 \*Renne, John Keith, Esq., M.A. Camb. 56, *Glover-street, Hyde-park, W.*
- 1834 \*Renne, M. D., Esq., C.B. 22, *Portman-street, Portman-square, W.*
- 1864 1580 Renne, W., Esq. 14, *Hyde-park-square, W.*
- 1830 \*Renwick, Lieutenant, R.F.
- 1831 Reuter, Julius, Esq. 1, *Royal Exchange-buildings, E.C.*
- 1858 Revnaldson, Henry Bach, Esq. *Abney, near Tatsworth, Oxfordshire.*
- 1857 Richards, Capt. George H., R.N. *Hyde-park-street, Abney, S.W.*
- 1860 Richards, the Rev. George, D.D.
- 1864 Richardson, F., Esq. *Port-hedge, Bloomsbury-park.*
- 1863 Rickard, Major F. L., Government Inspector of Mines, Argentine Republic. *Cave of Mr. Samuel, 1, George-street, Moulton-lane, E.C.*
- 1859 Rickard, Edward Henry, Esq. 4, *Chesham-street, Hyde-park, W.*
- 1862 R. H. Henry P. A. Bu. Esq. *The Palace, Moulton, Kent.*
- 1865 1590 \*Ridout, W. J., Esq. 12, *Weston-street, Strand, W.C.*
- 1864 Ridley, F. H., Esq. 19, *Blount-street, Moulton-hall, W.*
- 1864 Ridley, George, Esq. 2, *Chesham-street, Berkeley-square, W.*
- 1862 \*Ridley, Col. Christopher Palmer, C.B., H.M.B. Consul, *Zanzibar; and Oriental Club, W.*
- 1862 Ridley, Joseph D., Esq. *Essex, Surrey; and Ken-green, Surrey, W.*
- 1860 Rintoul, Robert, Esq. *Windham Club, S.W.*
- 1863 Ritme, John, Esq. 22, *Blessington-road, Lee, Kent.*
- 1830 \*Robe, Maj.-General Fred. Holt, C.B. *U. S. Club, S.W.; and 5, Palace-garden-terrace, Kensington, W.*



Year of  
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- 1857 1630 Ross, John, Esq., M.A. 2, *Brighthelmston, Pall-mall, E.C.*  
 1858 Ross, Wm. Andrew, Esq. 7, *Albion-street, W.*  
 1844 \*Rose, William, Earl of, M.A., F.R.S. *Buckingham Palace, Kensington, King's Court, Richmond.*  
 1864 \*Roundell, C. S., Esq. 44, *Pine-street, W.*  
 1862 Roundell, Robert Paolo, Esq., M.A., Q.C. 45, *Albion-street, W.*  
 1859 \*Rous, Vice-Admiral the Hon. Henry John, 14, *Buckingham-street, W.*  
 1864 Routh, E. J., Esq. 84, *Pine-street, C.*  
 1862 Rowe, John, Esq., 1, *Chancery-lane, W.*  
 1863 Rowley, Comm. C., R.N. 48, *Queens-square, Piccadilly, S.W.*  
 1856 Racken, J. Anthony, Esq. *Buckingham-street, S.E.*  
 1861 1645 \*Rambold, Charles James Augustus, Esq. *Trinity College, Cambridge; and 5, Percy-street, Piccadilly.*  
 1861 Rambold, Thomas Henry, Esq.  
 1860 Ransley, Major-General Rodall, Vice-President Council of Military Education 12, *Chancery-lane, S.W.*  
 1858 \*Russell, Arthur John Lewis, Esq., M.P. 2, *Abingdon-street, W.*  
 1850 \*Russell, Jesse Watts, Esq., D.D., F.R.S.  
 1850 Russell, John, Esq., F.R.S. 37, *Chancery-lane, S.W.;* *Pearson-street, Richmond, S.W.;* *Leicester-street, London; and 4, North-street, N.B.*  
 1860 Russell, Wm. Howard, Esq., LL.D. 18, *St. James's-square, Grosvenor-street, S.W.*  
 1860 Ruthford, John, Esq. 2, *Chancery-lane, Chancery-lane, W.*  
 1857 \*Ryder, Capt. Abel P., R.N. 11, *St. James's-square, S.W.; and 1, Lambeth-street, Upplington.*  
 1864 Ryder, G., Esq. 10, *King's Bench-street, Temple, F.C.*
- 1852 1650 Sabine, Major-General Elw., R.A., Pres. R.S., F.R.S., &c. &c. 1, *Aschley-place, Fenchurch-street, Westminster, S.W.; and 1, West-street, S.E.*  
 1847 St. Asaph, W. Ray, Esq., Vicar: Rector, Bishop of. 1, *St. Asaph, N.B.*  
 1857 St. David's, Canon F. G. Wall, Bishop of. 1, *St. David's, Carmarthen.*  
 1863 St. George, Major-General J. 17, *St. James's-square, S.W.*  
 1863 St. John R. H. St. Andrew, Esq., 1, *St. James's-square, S.W.*  
 1862 St. John Spencer, Esq., Chargé d'Affaires, Port-au-Prince, Haiti. 25, *Grosvenor-street, St. James's-square, N.W.*  
 1863 Sale, Lieut. M. F., R.N. 1, *St. James's-square, S.W.*  
 1845 \*Salomons, David, Esq., M.P., Alderman, F.R.S., &c. 26, *Great Cornhill-street, W.; and 1, Lombard-street, near Lombard-street, S.W.*  
 1863 \*Salt, Henry, Esq. 29, *Grosvenor-street, W.C.*  
 1861 Salt, William Severin, Esq. 24, *St. James's-square, S.W.*  
 1861 1665 \*Sandbach, Wm. Robertson, Esq. 10, *Princes-street, H. Le-park, S.W.*  
 1862 Sandford, Major Henry Ayshford. 20, *Chester-street, Grosvenor-street, W.; and 1, New-street, Westminster, Somerset.*



Year of Election.	
1853	Santos, Le Chev. G. dos. 12, Gloucester-place, Portman-square, W.
1855	Sarel, Lieut.-Colonel H. A., 17th Lancers. Army and Navy Club, S.W.; and <i>Stamphoe</i> .
1862	Sargood, F. J., Esq. Moorgate-street, <i>Albion</i> , L.C.
1865	Sartoris, Alfred, Esq.
1852	Samuarez, Captain Thomas, R.N. <i>The Foss, Jersey</i> .
1866	Saunders, James L., Esq. 9, Finsbury-avenue; and Grosvenor-place, Bloomsbury, N.E.
1864	Saunin, Admiral E. Prince's-pate, S.W.
1863	Sawyer, Col. Charles, 8th Dragoon Guards. <i>Heron Island, Middlesex</i> .
1863	1670 Sawyer, Captain Frederick. <i>Gifford-street; and Moorfields, Finsbury, S.</i>
1838	Scarlett, Lieut.-General the Hon. Sir J. Yorke, K.C.B. <i>Portsmouth</i> .
1861	Schenley, Edward W. H., Esq. 14, Prince's-pate, S.W.
1866	Scott, Adam, Esq. 3, Bedford-terrace, Wotton-under-terrace, W.
1859	Scott, Lord Henry, M.P. 3, Talbot-street, Finsbury, W.
1861	*Scott, Hercules, Esq. <i>Brook-street, near Moorfields, N.B.</i>
1855	Scott, Admiral Sir James, K.C.B. United Service Club, S.W.
1864	Scott, John, Esq. 3, Chester-place, Hyde-park, W.
1866	Scott, John, Esq., M.D.
1866	Scott, William, Esq. 14, St. James's-pate, S.W.
1863	1680 Scovell, George, Esq. 34, Grosvenor-place, S.W.
1861	Seabolt, James, Esq. 80, Lancaster-gate, W.
1830	*Sedgwick, the Rev. A., Woodwardian Lecturer, M.A., F.R.S. <i>Athenæum Club, S.W.; and Cambridge</i> .
1862	Seemann, Berthold, Esq., Ph.D., F.R.S. 22, Cranbury-square, N.
1866	Severall, Walter T., Esq., Inspector of Schools in Ceylon. <i>Columbo</i> .
1865	Sercombe, Edwin, Esq. 49, Brook-street, Grosvenor-square, W.
1858	*Serocold, Charles P., Esq. <i>Brewery, Liverpool-street, L.C.</i>
1853	Sevin, Charles, Esq. 155, Fenchurch-street, L.C.
1853	Sewell, Henry, Esq. 15, Cuthwell-court, Throgmorton-street, E.C.; and <i>Stamford-hill, N.</i>
1858	Seymour, George, Esq. 17, Gracechurch-street, L.C.; and 12, Sussex-square, Hyde-park, W.
1855	1690 Seymour, Admiral Sir Geo. F., K.C.B., G.C.H. 115, Eaton-square, S.W.
1853	*Seymour, Henry Danby, Esq., M.P. 59, Upper Grosvenor-street, W.; <i>Knolly-Hendon, Wilt;</i> and <i>Glastonbury, Somersetshire</i> .
1854	*Shadwell, Captain Charles F. A., R.N., C.B. Royal Naval Hospital, Haslar, Gosport.
1860	*Shadwell, Lieut.-Colonel Lawrence.
1856	*Share, James Masters, Esq., R.N. H.M.S. <i>St. George, Portland, Dorsetshire</i> .
1866	Sharp, Henry T., Esq. 102, Piccadilly, W.
1861	Sharp, Peter, Esq. <i>Oldfield, Ealing, W.</i>
1861	*Sharpe, William John, Esq. 1, Victoria-street, Westminster, S.W.; and <i>Norwood, Surrey, S.</i>
1862	*Shaw, John, Esq. <i>Pineyand, Otago, New Zealand</i> .

Year of  
Election.

- 1851 Shaw, John Ralph, Esq. *Saul-key, Hockley, Berkshire.*
- 1858 1700 Shea, John, Esq., M.D., Surgeon R.N. 84, *Blanchifours-road, S.*
- 1846 Sheffield, George A. F. C., Earl of. 20, *Portman-square, W.; and Stopheld-st., Sussex.*
- 1857 Shell, Major-Gen. Sir Justin, K.C.B. 12, *Lincoln's Inn, Portico-square, S.W.*
- 1851 Shephard, Chas. Douglas, Esq., Surg. R.N.
- 1851 Shephard, Rev. Edw'd. John, M.A. *Trotter's-lake, Kent; and Athenæum Club, S.W.*
- 1850 Sheridan, H. Brinsley, Esq., M.P. *Bellefield-house, Portico-square, Finsbury, S.W.*
- 1853 Sheridan, Rich'd. B., Esq., M.P. 43, *Grosvenor-place, S.W.*
- 1857 Sharin, Joseph Samuel, Esq., LL.D., PH. DR. *Leighton-house, Leighton-crescent, Kent's-town, N.W.*
- 1859 \*Sherwill, Lt.-Col. W. S., F.R.S. *Prof. of Surveying, Col. Lmge. College, Calcutta; and Perth, N.B.*
- 1858 \*Shipley, Conway M., Esq. *Army and Navy Club, S.W.; and Raheny, Dublin.*
- 1856 1710 Sholl, Charles, Esq., C.E. 32, *Surrey-street, W.C.*
- 1852 Shower, Lieut.-Col. Charles S.
- 1856 Shuttleworth, Sir J. P. Kay, Bart. 33, *Globe-street, W.; and Gouthorp-hall, Bradley, Lancashire.*
- 1855 Silva, Frederic, Esq. *The Wood-lodge, Shooter's-hill.*
- 1859 Silver, the Rev. F. L. M.A., F.R.A.S. *Norton-rectory, Market Drayton, Salop.*
- 1859 \*Silver, Stephen Wm., Esq. 66, *Cornhill, E.C.; and Norwood-lodge, Lower Norwood, S.*
- 1853 Silver, William, Esq., M.A., Barrister-at-Law. *Park-house, Park-lane, Croydon, S.*
- 1850 Sim, John Coy-games, Esq. 13, *James-street, Buckingham-gate, S.W.*
- 1853 Simmons, Edward R., Esq., Barrister-at-Law. 4, *Hampden-st., S.W.*
- 1848 Simmons, Colonel John L. A., R.E., C.B. *H. B. M.'s Consul, Warsaw; United Service Club, S.W.*
- 1856 1720 Simons, Henry M., Esq. 73, *Gloucester-terrace, W.*
- 1853 Simpkinson, Lieut. Francis G., R.N. 55, *Victoria-street, Westminster, S.W.*
- 1854 Simpson, Frank, Esq. 17, *Whitehall-place.*
- 1852 Simp-on, Henry Bridgeman, Esq. 44, *Upper Grosvenor-street, W.*
- 1851 Simpson, James, Esq., C.E., F.R.S. 29, *Great George-street, Westminster, S.W.*
- 1853 \*Simpson, Wm., Esq. 64, *Lincoln's-inn-fields, W.C.*
- 1856 \*Sims, Richard Procter, Esq., C.E. *Malabar-hill, Bombay. Care of Messrs. Smith, Elder, and Co.*
- 1858 Sk Amersdale, Edward, Lord. *Lutton-park, Ormskirk, Lancashire.*
- 1856 Skinner, John E. H., Esq. 3, *Dr. Johnson's-buildings, Temple, E.C.*
- 1856 Skarbneck, Baron A., Lieutenant of the Austrian Navy. *Marine Academy, Fiume, Austria. Care of F. Engelhardt, Esq., 9, Balliter-square, E.C.*
- 1853 1730 Skaine, Hy. D., Esq. *Warleigh-mansion, near Bath.*
- 1851 Sladen, Rev. Edward Henry Mainwaring. *Alton, near Marlborough, Wilts.*
- 1851 Sligo, G. J. Browne, Marquis of. 14, *Mansfield-street, W.; and Westport, County Mayo.*
- 1855 Smedley, Joseph V., Esq., M.A. *Oxford and Cambridge Club, S.W.*

Year of  
Election

- 1855 \*Smith, Augustus Henry, Esq. *Fleeford-house, Guildford.*  
 1866 Smith, Drummond, Esq. 7, *Mount-street, Berkeley-square, W.*  
 1859 Smith, Edward, Esq. *Dublin Castle.*  
 1853 Smith, George, Esq. *Glinton, near Market Deeping, Lincolnshire.*  
 1857 Smith, George R., Esq. 73, *Edton-square, S.W.; and Telsden-park, Surrey.*  
 1865 Smith, Gunkiford, Esq. 63, *Chering-cross, S.W.*  
 1857 1740\*Smith-Bosanquet, Horace, Esq. *Brosbourne-borough, Huddesdon.*  
 1861 Smith, Jervose, Esq. 47, *Belgrave-square, S.W.*  
 1854 Smith, John, Esq., Memb. Geograph. Soc. Bombay. 27, *Prince's-gate, S.W.*  
 1853 Smith, John Harrison, Esq. 49, *Inneress-terrace, W.*  
 1853 Smith, John Henry, Esq. 1, *Lombard-street, L.C.; and Purley, Croydon, Surrey.*  
 1861 Smith, J. Sidney, Esq., Barrister-at-Law. *Sidney-lodge, Wimbledon-common, S.W.*  
 1861 \*Smith, Joseph Travers, Esq. 25, *Throgmorton-street, L.C.*  
 1838 \*Smith, Octavius Henry, Esq. *Thames-bank, Westminster, S.W.*  
 1857 Smith, Captain Philip, Grenadier Guards.  
 1841 \*Smith, Thomas, Esq.  
 1860 1750Smith, William, Esq., C.E. 19, *Salisbury-street, Strand, W.C.*  
 1859 \*Smith, W. Castle, Esq. 1, *Gloucester-terrace, Regent's-park, N.W.*  
 1857 Smith, Wm. Gregory, Esq. *Hudson-bay Company, Fenchurch-street, E.C.*  
 1859 Smith, William Henry, Esq. 1, *Hyde-park-street, W.*  
 1837 \*Smyth, Rear-Adm. William. *Care of Messrs. Child and Co., Temple-bar.*  
 1850 \*Smythe, Colonel William J., R.A.  
 1863 Snowden, Francis, Esq., M.A. 1, *Dr. Johnson's-buildings, Temple, E.C.*  
 1865 Solomons, Hon. Geo. *Crown Hotel, W.C.; and Janitor.*  
 1839 \*Someis, Charles, Earl. 33, *Prince's-gate, S.W.; Eastnor-castle, Herefordshire; and The Priory, Reigate, Surrey.*  
 1862 Somerset, Capt. Leveson E. H., R.N. *Care of Messrs. Chard, 3, Clifford's-inn, Fleet-street, L.C.*  
 1858 1760\*Some, Joseph, Esq. *Fortismere, Moxwell-hill, N.*  
 1855 Sopwith, Thos., Esq., M.A., C.E., F.R.S. 103, *Victoria-street, Westminster, S.W.*  
 1845 \*Sotheby, Lt.-Col. Fred. S., C.B., F.R.A.S. 100, *Park-lane, W.*  
 1861 South, John Flint, Esq. *Bluckheath-park, S.E.*  
 1860 Southesk, James Carnegie, Earl of. *Kinnaird-castle, Brechin, N.B.*  
 1860 \*Southey, Jas. Lowther, Esq. *Care of Messrs. Sturwell.*  
 1865 Spalding, Samuel, Esq. 7, *Upper Park-road, South Hampstead.*  
 1850 \*Spencer-Bell, James, Esq. 1, *Devonshire-place, Portland-place, W.*  
 1863 Spickernell, Dr. Geo. E., Principal of Eastman's Royal Naval Establishment. *Eastern-parade, Southsea.*  
 1861 Spoforth, Markham, Esq. 3, *Porchester-terrace, W.*  
 1855 1770\*Spottiswoode, William, Esq., F.R.S. 50, *Grosvenor-place, S.W.*  
 1859 \*Spiatt, Capt. Thos. A. B., R.N., C.B. *Mount Ephraim, Tunbridge-wells, Kent.*  
 1866 Spruce, Richard, Esq., PH. DR. *Hurstpierpoint, Sussex.*

Year of Election	
1859	Stafford, Edward W., Esq. <i>Colonial Secretary of New Zealand; care of Mr. J. S. Tytler, 19, Castle-street, Edinburgh.</i>
1853	Stanford, Edward, Esq. 6, <i>Charing-cross, S.W.</i>
1855	Stanhope, Philip Henry, Esq., Pres. Soc. of Antiquaries. 3, <i>Grosvenor-place-houses, Grosvenor-place, S.W.; and Chesham, Surrey, Kent.</i>
1860	*Stanhope, Walter Spencer, Esq. <i>Cannon-hill, Barmley, Yorkshire.</i>
1856	Stanley, Edmund Hill, Esq. <i>Craven-hotel, Strand, W.C.</i>
1853	*Stanley, Edward Henry, Lord, M.P., D.C.L. 23, <i>St. James's-square, S.W.</i>
1863	Stanton, Geo., Esq. <i>Cotton-hill, Shrewsbury; and Council the Club, S.W.</i>
1856	1780Statham, John Lee, Esq. 60, <i>Wimpole-street, W.</i>
1863	*Staveley, Miles, Esq. <i>Old Steningford-hall, Ripon.</i>
1830	*Stephen, Sir George. <i>Melbourne; care of Mr. H. W. Renscroft, 7, Gray's-inn-square, W.C.</i>
1857	Stephenson, Sir R. Macdonald, C.E. 6, <i>Upper Hyde-park-gardens, W.; and Lust-cottage, Worthing.</i>
1866	Stepney, A. K. Cowell, Esq. 6, <i>St. George's-terrace, Knightsbridge, W.</i>
1860	Sterling, Col. Sir Anthony. <i>The White Cottage, South-pl., Knightsbridge, W.</i>
1862	Sterry, Henry, Esq. 7, <i>Paragon, Southwark, S.E.</i>
1855	Stevens, Henry, Esq., F.S.A. 4, <i>Trafalgar-square, Charing-cross, W.C.</i>
1841	Stevenson, Thomas, Esq., F.S.A. 37, <i>Upper Grosvenor-street, W.</i>
1861	Stewart, Alex. Jas. Robt., Esq. 12, <i>Belgrave-square, S.W.; and Ards-house, Donegal.</i>
1866	1790Stewart, Rev. Dr. James. <i>Loredale, Alice, South Africa.</i>
1860	*Stewart, Major J. H. M. Shaw, Royal Madras Engineers.
1863	*Stewart, John, Esq. <i>Junior Carlton Club, S.W.; and Nately-hall, Lancashire.</i>
1860	Stirling, Capt. Frederick Henry, R.N. <i>H.M.S. 'Hero.'</i>
1860	Stirling, Sir Walter, Bart. 36, <i>Portman-square, W.</i>
1860	Stocker, John Palmer, Esq. 93, <i>Orford-terrace, Hyde-park, W.</i>
1845	*Stokes, Rear-Admiral John Lort. <i>United Service Club, S.W.; and Scotchchurch, Haverfordwest, Wales.</i>
1866	Strachey, Colonel Richard, R.L., F.R.S. 29, <i>Leicester-gate, Hyde-park, W.</i>
1861	Strange, Lieut.-Col. Alexander. 41, <i>Brington-crescent, S.W.</i>
1858	Strangford, Percy Ellen, Viscount. 58, <i>Camberland-street, W.</i>
1858	1800Stratford de Redcliffe, Stratford Canning, Viscount. 29, <i>Grosvenor-square, W.</i>
1864	Straton, N. D. J., Esq. <i>Aylestone, Leicester.</i>
1860	Strickland, Edward, Commissary-General. <i>New Zealand. Care of Messrs. Ridgway and Co., 2, Waterloo-place, S.W.</i>
1865	Strong, F. K., Esq., K.H. <i>Hamburg, Germany; care of A. Strong, Esq., 43, Lincoln's-inn-fields, W.C.</i>
1853	Strutt, George H., Esq., F.R.A.S. <i>Bridge-hill, Belper.</i>
1858	Strutt, Captain Hammel Ingold, F.R.A.S. <i>Royal Mail Steam Packet Company, Southampton.</i>
1859	*Strutt, Captain William. 26, <i>Richmond-place, Southampton.</i>
1853	*Strzelecki, Count P. E. de, C.B., F.R.S. 23, <i>Savile-row, W.</i>

Year of  
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- 1859 Stuart, Lieut.-Col. J. F. Dudley Crichton, M.P., Grenadier Guards. 25, Wilton-crescent, Belgrave-square, S.W.
- 1866 Stuart, Major Robert. *Junior, Albion. Care of Messrs. Bull, Hunter, and Co., 52, Wigmore-street, W.*
- 1831 1810 Stuart, Vice-Chancellor Sir John. 11 and 12, Old-buildings, Lincoln's-inn, W.C.; 5, Queen's-jute, Hyde-park, W.; and Grushernish, Isle of Skye, Invernesshire.
- 1833 Stuart, Capt. Charles, R.L.S. *St. Edmond's, Taoli, Cheltenham.*
- 1862 Stutfield, William, Esq. 15, Leinster-terrace, Hyde-park, W.; and Myddel-park, Canterbury.
- 1858 Sudeley, Lord. 5, Seagmore-place, Church-street, W.
- 1857 Sullivan, Captain Bartholomew J., R.N., C.B. *Board of Trade, S.W.*
- 1865 Sullivan, R.-Admiral T. W., C.B., R.N. *Kington, Weylyn, Herts.*
- 1862 Surridge, Rev. Henry Arthur Dillon, M.A. 21, Berners-street, W.
- 1862 Surtees, Capt. Charles Fieville, M.P. *Chalcott-house, Long Ditton, Surrey.*
- 1861 \*Sutherland, George Granville William, Duke of. *Stafford-house, St. James's Palace, S.W.*
- 1856 Sutherland, Kenneth L., Esq., Paymaster R.N., Barrister. *Junior. U.S. Club, S.W.; Chesterfield-house, Weymouth; 6, Clarence-passage, Southsea, Hants; and the Royal Yacht, Portsmouth.*
- 1840 1820 \*Sutherland, Robert, Esq. *Carmona Bank, Dunoon, Argyshire.*
- 1864 Swamy, Mutu C., Esq. *Athenæum Club.*
- 1857 Swanzy, Andrew, Esq. 38, Cannon-street, E.C.
- 1836 \*Swinburne, Rear-Admiral Charles H. 18, Grosvenor-place, W.; and Cupheaton, near Newcastle-upon-Tyne.
- 1862 \*Swinburne, Lieut. Sir John, Bart., R.N. *Cupheaton, Newcastle-upon-Tyne.*
- 1833 Swinhoe, Robert, Esq., H.B.M. Consul, Formosa. *Care of Messrs. Smith, Elder, and Co.*
- 1859 Sykes, Christopher, Esq., M.P. *Sledmere, Malton.*
- 1851 Sykes, Colonel William Henry, M.P., F.R.S., Hon. M.R.I.A. *Athenæum Club, S.W.; and 47, Albion-street, Hyde-park, W.*
- 1864 Symonds, F., Esq., M.D. *Beumont-street, Oxford.*
- 1852 \*Syngge, Col. Millington H., R.E. *Birmingham.*
- 1852 1830 Tagart, Courtenay, Esq. *Reform Club, S.W.; and Paris.*
- 1859 Tagart, Francis, Esq. 31, Craven-hill-jardens, Hyde-park, W.
- 1864 Tait, P. M., Esq. 162, Adelaide-road, N.; and Oriental Club, W.
- 1857 \*Tait, Robert, Esq. 14, Queen Anne-street, W.
- 1861 Talbot de Malahide, Lord. *Malahide Castle, Co. Dublin.*
- 1861 Tayler, Joseph Walter, Esq. 1, Oak-villas, Acton, Middlesex, W.
- 1861 Taylor, Commander A. Dundas, L.N. 6, Nightingale-road, Lower Clapton, N.E.
- 1865 Taylor, H. L., Esq. *Reform Club, S.W.; and 32, Phillimore-gardens, Kensington, W.*
- 1865 Taylor, Rev. Jas. Hudson. *Ningpo, China. Care of Mr. Berger, Saint-hill, East Grinstead.*

Year of Election.	
1854	*Taylor, John Stopford, Esq., M.D. 1, <i>Springfield, St. Anne-street, Liverpool.</i>
1863	1840 Taylor, John, Esq. <i>Lymington-villa, Lower Norwood, Surrey, S.</i>
1863	Taylor, Col. R. C. H. 16, <i>Eaton-place, S.W.; and Carlton Club S.W.</i>
1864	Taylor, W. R., Esq.
1857	Teesdale, John M., Esq. <i>Litham-house, Ebbwasi, S.E.</i>
1863	Tegg, Wm., Esq. 13, <i>Doughty-street, Molesbury-square, W.C.</i>
1860	Templeton, John, Esq. 24, <i>Budge-row, E.C.</i>
1857	Tennant, Professor James. 149, <i>Strand, W.C.</i>
1859	Tennant, Major J. F., Bengal Engns. <i>Director of the Observatory, Madras.</i> <i>Care of Messrs. Smith, Iwer, and Co., Cornhill.</i>
1830	*Thatcher, Colonel, R.I.C.
1865	Theel, William F., Esq. <i>Compton-lodge, Kensington, W.</i>
1863	1850 Thomas, G., Esq. <i>Queen's-gardens-terrace, Hyde-park, W.</i>
1854	Thomas, Henry Harrington, Esq. <i>Lansdowne-crescent, Bath.</i>
1864	Thomas, J. R., Esq., Staff Assist. Surg. <i>Castle-hill, Fishguard, Pembrokeshire.</i>
1865	Thomas, John H., Esq. <i>Custom-house, E.C.</i>
1859	Thompson, Thomas A., Esq.
1854	Thompson, William C., Esq.
1865	Thomson, James, Esq. <i>Dunstable-house, Richmond.</i>
1863	Thomson, James Duncan, Esq., Portuguese Consul. <i>St. Peter's-embassy, Cornhill, E.C.</i>
1848	*Thomson, J. Turnbull, Esq. <i>Chief Surveyor, Otago, New Zealand.</i>
1866	Thomson, John, Esq. 4, <i>Montague-street, Edinburgh.</i>
1861	1860 *Thomson, Ronald Ferguson, Esq., 1st Attache to the Persian Mission. <i>Care of</i> <i>F. B. Alston, Esq., Foreign-office, S.W.</i>
1854	*Thomson, Thomas, Esq., M.D., F.R.S. <i>Hops-house, Kew, W.</i>
1865	Thomson, W. T., Esq. 21, <i>James-street, Birmingham-gate, S.W.</i>
1862	*Thorne, Augustus, Esq. 4, <i>Cullum-street, City, E.C.</i>
1847	Thornton, Rev. Thomas Cooke, M.A., M.R.I. <i>Brock-hall, near Wotton,</i> <i>Northamptonshire.</i>
1858	Thorold, Rev. A. W. 16, <i>Bedford-square, W.C.</i>
1854	Thorold, Henry, Esq. <i>Cuxwold, Lincolnshire.</i>
1865	Thring, Henry, Esq. 5, <i>Queen's-gate-gardens, W.</i>
1861	Thrupp, John, Esq. <i>Orchard-hill, Subiton, S.W.</i>
1859	Thuillier, Lt.-Col. H. L., Surveyor-General of India. <i>Calcutta; Messrs. Girdling</i> <i>and Co.; Care of J. Walker, Esq., India Office.</i>
1865	1870 Thurburn, C. A., Esq. 29, <i>Queensborough-terrace, Kensington-gardens, W.</i>
1864	*Thurburn, Hugh, Esq. 108, <i>Westbourne-terrace, W.</i>
1861	Thurlow, the Hon. Thos. J. Hovell. <i>British Embassy, Paris. Care of F. B.</i> <i>Alston, Esq., Foreign Office, S.W.</i>
1846	*Tindal, Charles John, Esq. <i>New South Wales.</i>
1839	*Fiene, John A., Esq. <i>Briarley, Ayrshire, near Liverpool.</i>
1862	Toddl, John, Esq. <i>Sydney. Messrs. Blyth and Hurdottle, 1, Alderman-street, E.C.</i>
1865	Toddl, Rev. John W. <i>Taylor-hall, Forest-hill, Sydenham, S.</i>

Year of  
Election.

- 1853 \*Tomlin, George Taddy, Esq., F.S.A. *Combe-house, Bartonfields, Canterbury; and Windham Club, S.W.*
- 1853 Tomline, George, Esq., M.P. 1, *Carlton-house-terrace, S.W.*
- 1835 \*Tooke, Arthur Wm., Esq., M.A. *Pinner-hill-house, near Watford, Middlesex.*
- 1856 1820 Torrance, John, Esq. 5, *Chester-place, Hyde-park-square, W.*
- 1806 Torrens, Robert Richard, Esq. 2, *Gloucester-place, Hyde-park, W.; and The Cott, Hohn, near Ashburton, South Devon.*
- 1859 Townsend, Commander John, R.N. *Lond, Weston-super-Mare.*
- 1866 Townson, Wm. Parker, Esq., B.A. Cantab. *Cure of the Head Master of the Collegiate School, Brisbane.*
- 1846 \*Towry, George Edward, Esq.
- 1858 Towson, J. Thomas, Esq. *Secretary Local Marine Board, Liverpool.*
- 1864 \*Toynbee, Capt. Hy. *Commanding the East-India Ship 'Hotspur' 25, Inverness-road, Kensington-gardens, W.*
- 1863 \*Tozer, Rev. H. F., M.A. *Exeter College, Oxford.*
- 1864 Tracy, the Hon. C. H. 11, *George's-street, W.*
- 1863 \*Travers, Aich., Esq. *Addison-road (opposite the Nupier-road), Kensington, W.*
- 1859 1890 Tremlett, Rev. Francis W., M.A. *Belsize-park, Hampstead, N.W.*
- 1865 \*Trench, Capt. the Hon. Le Poer, R.E. 32, *Hyde-park-gardens, W.; and Ordnance Survey Office, Pinlipo, S.W.*
- 1863 Trestnail, Rev. Frederick. *Stammore-villa, Beulah-hill, Upper Norwood, S.*
- 1862 Trevelyan, Sir Charles Edward, K.C.B. 8, *Grosvenor-crescent, S.W.*
- 1830 Trevelyan, Sir Walter Calvely, Bart., M.A., F.S.A., F.L.S., F.R.S.N.A., &c. *Athenium Club, S.W.; Wallington, Northumberland; and Nettlecombe, Somerset.*
- 1864 Trimmer, Edmund, Esq. *Cure of Messrs. Trimmer and Co., New City-chambers, Bishopsgate-street, E.C.*
- 1862 Tuckett, Francis Fox, Esq. *Frenchay, near Bristol.*
- 1835 \*Tuckett, Frederick, Esq. 4, *Mortimer-street, Cavendish-square, W.*
- 1865 Tuckett, Philip D., Esq. 113, *Piccadilly, W.*
- 1852 Tudor, Edward Owen, Esq., F.S.A. 46, *Westbourne-terrace, W.*
- 1857 1500 Tudor, Henry, Esq. 46, *Westbourne-terrace, W.*
- 1864 Turnbull, George, Esq., C.E., F.R.A.S. 39, *Craven-hill-gardens, W.*
- 1834 \*Turnbull, Rev. Thos. Smith, F.R.S. *University Club, S.W.; and Blofield, Norfolk.*
- 1863 Turner, Thos., Esq. *Guy's Hospital, Southwark, S.*
- 1864 \*Twentyman, A. C., Esq. *Tettenhall-wood, near Wolverhampton.*
- 1863 Twentyman, Wm. H., Esq. *Manor-house, St. John's-wood, N.W.*
- 1863 \*Twisleton, Hon. E. F. *Rutland-gate, S.W.*
- 1849 Twiss, Travers, Esq., D.C.L., F.R.S. 19, *Park-lane, W.*
- 1851 Twyford, Capt. A. W., 21st Hus.ars. *Reform Club, S.W.; and Cosham-house, Cosham, Hants.*
- 1865 Tyer, Edward, Esq., C.E., F.R.A.S. 15, *Old-jewry-chambers, E.C.*
- 1862 1910 Tyler, George, Esq. 24, *Holloway-place, Holloway-road, N.*
- 1862 Tylor, Edward Burnet, Esq. *Linlen, Wellington, Somerset.*
- 1859 Tyler, Capt. W. Fraser. *Aldourie, Inverness.*

Year of  
Election.

- 1862 Underhill, Edward Bean, Esq., LL.D. *Derwent-lodge, Thurlow-road, Hampstead, N. W.*
- 1861 Ussher, John, Esq. *Arthur's Club, St. James's Street, S. W.*
- 1858 \*Uzielli, Theodosius, Esq. 114, *Piccadilly, W.*
- 1844 \*Vacher, George, Esq. *Minor-house, Teddington.*
- 1862 \*Vander Byl, P. G., Esq. *Care of Mr. H. Pylt, 17, Gracechurch-street, E. C.*
- 1865 Vane, G., Esq. *Croydon. Messrs. Price and Boustead.*
- 1858 Vandon, Arthur, Esq. *Worth, Craveley, Sussex.*
- 1857 1920 Vardon, Thomas, Esq. *Library, House of Commons, Palace, Westminster, S. W.*
- 1856 \*Vaughan, James, Esq., F.R.C.S., Bombay Army. *Bulth, Breconshire.*
- 1861 Vaughan, J. D., Esq., Assist. Res. Councillor and Police Magistrate of Singapore. *Care of J. Little, Esq., 20, Cannon-street, E. C.*
- 1861 Vaughan, Nash Vaughan Edward, Esq. *Idwola, near Neot; and Lanelay, near Pontyfield, Glamorganshire.*
- 1849 Vaux, William S. W., Esq., M.A., F.S.A. *British Museum, W. C.*
- 1852 \*Vavasour, Sir Henry M., Bart. 8, *Upper Grosvenor-street, W.*
- 1855 Vavasour, James, Esq. *Knockholt, near Secrocks, Kent.*
- 1863 \*Vereker, the Hon. H. P., LL.D., H.M. Consul at Rio Grande do Sul. 1, *Portman-square, W.*
- 1862 Verner, Edward Wingfield, Esq., M.P. 86, *Eaton-square, S. W.; and Cook-abbey, Bray, Co. Wicklow.*
- 1862 \*Verney, Edmond H., Commr. R.N. 32, *South-street, Grosvenor-square, W.*
- 1837 1930 \*Verney, Major Sir Harry C., Bart., M.P., F.R.A.S. *Travellers' Club, S. W.; 32, South-street, Grosvenor-square, W.; and Clapton-house, Bucks.*
- 1857 Verrey, Charles, Esq.
- 1852 Verulam, James Walter, Earl of. *Gorhumbury, near St. Alban's; Barry-hill, Surrey; and Messing-hall, Essex.*
- 1830 Vetch, Captain James, R.E., F.R.S. 48, *Finchley-road, St. John's-wood, N. W.*
- 1865 Vile, Thomas, Esq. 75, *Oxford-terrace, W.*
- 1865 Vincent, Minos C., Esq., C.E. 12, *Featherstone-buildings, W. C.; and Frankfort, Ohio, U. S.*
- 1857 Vincent, John, Esq. 4, *Granville-park, Blackheath, S. E.*
- 1858 Vines, William Reynolds, Esq., F.R.A.S. 4, *Thamesian, Holborn-hill, E. C.*
- 1863 Vivian, Major Quintus, late 8th Hussars. 17, *Chesham-street, S. W.*
- 1838 \*Vyvyan, Sir Richard Rawlinson, Bart., F.R.S. *Trelowarren, Cornwall.*



- Year of Election.
- 1852 1940 Wade, Mitchell B., Esq. 66, *South John-street, Liverpool*.
- 1864 Wade, R. B., Esq. 58, *Upper Seymour-street, Portman-square, W.*
- 1863 Wade, Thos. F., Esq., C.B., H.B.M. Secretary of Legation. *Pekin, China*.
- 1853 \*Wagstaff, William Raester, Esq., M.D., M.A.
- 1863 Waite, Henry, Esq. 3, *Victoria-street, Finsbury, S.W.*
- 1864 Wakefield, E. T., Esq. 40, *Pembroke-villas, Bayswater, W.*
- 1862 Walker, Col. C. P. Beauchamp. C.B. 97, *Onslow-square, S.W.; and United Service Club, S.W.*
- 1860 Walker, David, Esq., M.D., F.L.S., M.R.I.A.
- 1861 Walker, Edward Henry, Esq., Vice-Consul at Tripoli. *Newton-hall, Chester*.
- 1863 \*Walker, Frederick John, Esq. *Thornbury-house, Thornbury, Bristol*.
- 1863 1950 Walker, James, Esq., Managing Director of Madras Railway. 23, *Cambridge-square, Hyde-park, W.*
- 1859 \*Walker, Lt.-Col. James, Bombay Engineers. *Murree, near Rawul Pindé, Punjab*.  
*Care of J. Walker, Esq., India Office.*
- 1830 Walker, John, Esq., Hydrog. India Office. 9, *Castle-street, Holborn, W.C.*
- 1861 \*Walker, John, Esq. 60, *Porchester-terrace, W.*
- 1858 \*Walker, Captain John, H.M.'s 66th Foot. *Broom-hall, Colchester*.
- 1864 Walker, R. B. N., Esq. *Care of Mr. B's att, 38, South Castle-st., Liverpool*.
- 1860 Walker, Robert, Esq., M.D., Ass. Surg. R.N. 4, *Belvidere-place, Portobello, Edinburgh*.
- 1866 Walker, Sydney, Esq. 63, *Portsmouth-gardens, Maidenhead, W.*
- 1863 \*Walker, T. F. W., Esq. 6, *Brock-street, Bath; and Athenaeum Club, S.W.*
- 1853 Walker, Captain William Harrison, H.C.S. 3, *Gloucester-terrace, W.; and Board of Trade, S.W.*
- 1861 1960 Walker, William, Esq. *Training College, Peterborough*.
- 1861 Walker, Rev. William Henry, M.A. *Newton-rectory, Shipham, Norfolk*.
- 1866 Walker, William, Esq., F.S.A. 48, *Highgate-road, Tufnell-park, N.*
- 1854 Wallace, Alfred Russell, Esq. 9, *St. Mark's-crescent, Regent's-park, N.W.*
- 1861 Wallace, Rev. Charles Hill, M.A. 3, *Harley-place, Clifton, Bristol*.
- 1864 Waller, Horace, Esq. *St. Johnham-road, Croydon, S.*
- 1865 Waller, Sir Thos. Wathen, Bart. 16, *Eaton-square, S.W.*
- 1863 Wallich, George C., Esq., M.D. 11, *Earle-terrace, Kensington, W.*
- 1864 Walmsley, Sir Joshua, Government Resident Agent. *Natal*.
- 1860 Walpole, Capt. the Hon. F. *Travellers' Club, S.W.; and Rainthorpe-hall, Long Stratton, Norfolk*.
- 1863 1970 Walpole, Rt. Hon. Spencer, M.P. *Grafton-street, W.; and Tisbury, W.*
- 1853 Walter, Henry Fraser, Esq. *Poppleshill-hall, near Nottingham*.
- 1865 Walton, H. C., Esq., C.E. 26, *Seville-row, W.*
- 1863 Walton, J. W., Esq. 26, *Seville-row, W.*
- 1864 Walton, R. G., Esq., C.E.
- 1853 \*Ward, George, Esq.
- 1860 Ward, Admiral J. Hamilton. *Orchfield, Wimbledon-park, S.W.*
- 1865 Ward, Swinburne, Esq., Civil Commissioner. *Seychelles Islands*

Year of  
Election

- 1861 Waider, Rev. William. *Lonsdale Mission House, Dobbin; and Lond. Missionary Society, Blomfield-street, Finsbury, E.C.*
- 1862 Wadlaw, John, Esq. 57, *Prince's-gate, Kensington, W.*
- 1864 1980 Warner, E., Esq., M.P. *Hugham-hall, Woodford, Essex; and 49, Grosvenor-place, S.W.*
- 1859 Waite, Arthur B., Esq. 109, *Osborne-square, S.W.*
- 1862 Warren, Capt. Richard Pelham. *Wortling-horse, Dorchester.*
- 1852 Watkins, John, Esq., F.R.C.S., F.S.A. 2, *Falcon-square, Aldersgate-street, E.C.*
- 1862 Watney, John, Esq. 16, *London-street, Fenchurch-street, E.C.*
- 1859 Watson, James, Esq. 24, *Endsleigh-street, W.C.*
- 1860 Watson, James, Esq., Barrister-at-Law. *Cifton-hall, Redon, N.B.*
- 1861 Watson, John Harrison, Esq. 28, *Queensborough-terrace, Kensington-gardens, W.*
- 1853 Watts, J. King, Esq. *St. Ives, Huntingdonshire.*
- 1857 \*Waugh, Maj.-General Sir Andrew Scott, Bengal Engineers, F.R.S., late Surveyor-General and Superintendent Great Trig. Survey. *Athenium Club, S.W.; and 7, Petersham-terrace, Queen's-gate-gardens, South Kensington, W.*
- 1861 1990 Way, Arthur, Esq. *Ashton-lodge, Ashton, near Bristol.*
- 1858 \*Webb, Capt. Sydney. *Oriental Club, Hammer-square, W.; and 24, Manchester-square, W.*
- 1862 \*Webb, William Frederick, Esq. *Newstead-abbey.*
- 1836 \*Webber-Smith, Colonel James, 95th Regiment. 14, *Great Abchurch-lane, W.*
- 1865 Webster, Alphonsus, Esq. 44, *Mecklenburg-square, W.C.*
- 1858 Webster, George, Esq., M.D. *Dulwich, S.*
- 1864 Webster, L., Esq. *North-lodge, Ealing, W.*
- 1866 Webster, George, Esq. 40, *Finsbury-church, E.C.*
- 1860 Weguelin, Thomas Matthias, Esq., M.P. *Peninsular and Oriental Steam Navigation Co., Moorgate-street, E.C.*
- 1851 Weller, Edward, Esq. 34, *Red-lion-square, W.C.*
- 1853 2000 \*Wellington, Arthur Richard, Duke of, Major-General, D.C.L. *Apsley-house, W.; and Strathfield-lodge, Hampshire.*
- 1864 Wells, Sir Mordaunt, late Chief Justice Judge, Bengal. 107, *Villiers-street, S.W.*
- 1862 Wells, William, Esq. 22, *Dorton-street, W.; and Releigh, Penshurst, Kent.*
- 1863 Welman, Chas., Esq. *Nottingham, Trenton.*
- 1857 West, Lieut.-Colonel J. Temple. *Bennick-lodge, Ryde, Isle of Wight.*
- 1831 West, Rev. W. De Lancy, M.A., Head Master, Grammar School. *Barnard, Essex.*
- 1863 \*Westlake, John, Esq. 16, *Oxford-square, W.*
- 1859 Westmacott, Arthur, Esq. *Athenium Club, S.W.*
- 1844 \*Westminster, Richard, Marquis of. 33, *Upper Grosvenor-street, W.; Luton-hall, Cheshire; and Motcombe-house, Dorsetshire.*
- 1852 Weston, Alex. Anderson, Esq., M.A. 18, *Latend-gate, Hyde-park, S.W.*
- 1862 2010 Westwood, John, Esq. 8 and 9, *Queen-street-philae, South of Bridge, E.C.*
- 1863 Wetton, Champion, Esq. *Somerset-hill, Lorking.*
- 1839 \*Weyland, John, Esq., F.R.S. *Woodrising-hall, Norfolk.*

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1860	Wharnccliffe, Lord. 15, <i>Curzon-street</i> , W.
1861	Wharton, Rev. J. C. <i>Willesden-vicarage</i> , N.W.
1858	Wheatley, G. W., Esq. 150, <i>Leadenhall-street</i> , E.C.
1859	Wheelwright, William, Esq. <i>Gloucester-lodge, Regent's-park</i> , N.W.
1853	*Whinfield, Edward Wrey, Esq., B.A. <i>South Ellington-vicarage</i> , Louth.
1839	*Whishaw, James, Esq., F.S.A. 16, <i>Fork-terrace, Regent's-park</i> , N.W.
1862	Whitby, Capt. Edward, late 3rd Dragoon Guards.
1857	2020 White, Arthur D., Esq., M.D. 56, <i>Chancery-lane</i> , W.C.
1865	White, Lieut. Arthur Wellesley, R.A. <i>Fort Brockhurst, Gosport</i> .
1855	*White, Charles, Esq. 10, <i>Line-st.</i> , E.C.; and <i>Barnesfield, near Dartford, Kent</i> .
1857	White, Henry, Esq. 5, <i>Leicester-terrace, Upper Hyde-park-gardens</i> , W.
1862	White, Col. Henry Dalrymple, C.B. 39, <i>London-square</i> , S.W.
1862	White, James T., Esq. 20, <i>Cumberland-terrace, Regent's-park</i> , N.W.
1866	White, W. A., Esq. <i>Civil Service Club</i> , S.W.
1852	White, William Foster, Esq. <i>Treasurer, St. Bartholomew's Hospital</i> , E.C.
1863	*White, Wm. O., Esq. 10, <i>Line-street</i> , E.C.; and <i>Barnesfield, near Dartford, Kent</i> .
1862	Whitehouse, William Matthew Mills, Esq. 46, <i>Chepston-place, Bayswater</i> , W.; and <i>Huddricker-house, Studley, Warwickshire</i> .
1862	2030 Whitmore, William, Esq. 28, <i>Oxford-square</i> , W.; and <i>Beckingham, Kent, S.E.</i>
1860	Whitty, John Irwine, Esq., D.C.L., LL.D., M.A., C.E., &c. 94, <i>Lower Baggot-street, Dublin</i> ; <i>Ricketstown-hill, Co. Carlow</i> ; and <i>Providence-court, Queen's Co., Ireland</i> .
1865	Whympcr, Edward, Esq. <i>Town house, Holsmere</i> .
1864	Whyte, M. B., Esq.
1866	Wilkinson, Alfred, Esq. 14, <i>Fleaston-place, South Kensington</i> , W.
1860	*Wilkinson, Major A. Eastfield, B.A., 7th Hussars. <i>Umbohi</i> ; N.W. Provinces. <i>India</i> ; and <i>Army and Navy Club</i> , S.W. 'Pro.' to 7, <i>Cavendish-pl.</i> , Brighton.
1854	Wilkinson, Frederick E., Esq., M.D. <i>Sydenham, Kent, S.E.</i>
1865	Wilkinson, Dr. G. 4, <i>St. John's-wood-villas, St. John's-wood</i> , N.W.
1865	Wilkinson, J. J., Esq. 4, <i>St. John's-wood-villas, St. John's-wood</i> , N.W.
1839	*Wilkinson, Sir John Gardner, D.C.L., F.R.S. <i>Athenæum Club</i> , S.W.
1866	2040 Wilkin-on, Thomas, Esq. <i>Tynatave, Madejascar</i> .
1857	Willcock, J. W., Esq., Q.C. 6, <i>Stone-buildings, Lincoln's-inn</i> , W.C.; and <i>Rosenstead, Avenue-road, St. John's-wood</i> , N.W.
1863	Williams, Frederick, G. A., Esq. <i>Chapel-stairs, Lincoln's-inn</i> , W.C.
1856	Williams, Henry Jones, Esq. <i>Club-chambers</i> , S.W.; and 82, <i>King William-st.</i> , E.C.
1856	Williams, Henry R., Esq. <i>Board of Trade</i> , S.W.
1858	Williams, Robert Folkestone, Esq., F.G.S. 7, <i>Walpole-street</i> , S.W.
1857	Williams, Major-General Sir Wm. F., Bart., K.C.B., D.C.L., Commander-in-Chief, Canada. <i>Army and Navy Club</i> , S.W.
1830	*Willich, Charles M., Esq. 2, <i>Montpelier-square, Rutland-gate</i> , S.W.
1859	Willoughby, Henry W., Esq. 35, <i>Montagu-square</i> , W.

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1861	Wilson, Captain Anthony. 55, <i>Moorgate-street, E.C.; and 11, Chepstow-villas, Bayswater, W.</i>
1865	2050 Wilson, E., Esq. <i>Addiscombe Farm, Croydon.</i>
1865	Wilson, Capt. J. C., R.N. <i>Care of Messrs. Woodhead and Co.</i>
1854	*Wilson, Captain Thomas, R.N.
1862	*Wilson, Robert Dobie, Esq. 15, <i>Green-street, Grosvenor-square, W.</i>
1860	Wilson, Thomas, Esq. 121, <i>Southgate-road, N.</i>
1866	Wiltshire, Rev. M. A., F.G.S., F.L.S. <i>The Rectory, Bread-street-hill, E.C.</i>
1861	Windus, Commander Alfred Tubb, I.N. 14, <i>St. James's-square, S.W.</i>
1862	Wing, Commr. Arthur, R.N. <i>Care of Messrs. Case and Londensack.</i>
1863	Wingate, T. F., Esq. 20, <i>Down-street, Piccadilly, W.</i>
1862	Wingfield, Charles John, Esq. <i>Commissioner in Oude; and Athenæum Club, S.W.</i>
1864	2060 Wolchouse, J. H., Esq. H.M.'s Commissioner and Consul-General for the Sandwich Islands. <i>Care of F. B. Alston, Esq., Foreign Office.</i>
1865	Wolfe, Capt. William Maynard, R.A. <i>Arts Club, Hanover-square, W.</i>
1863	Wood, Hy., Esq. 10, <i>Cherland-square, Hyde-park, W.</i>
1865	Wood, Lieut.-Colonel Wm., R.M. 4, <i>Hyde-park-terrace, Cumberland-gate, W.</i>
1857	Woodhead, Captain H. J. Plumidge. 44, <i>Charing-cross, S.W.</i>
1863	Woods, Rev. Julian L., F.G.S. <i>Penola, South Australia.</i>
1862	Woods, Samuel, Esq. <i>Belford-park, Croydon.</i>
1864	Woolcott, Geo., Esq. <i>Curvish Chib, W.; and 60, Gracechurch-street, E.C.</i>
1862	Woolrabe, F., Esq. <i>Tasmania.</i>
1863	Worcester, J. R., Esq. <i>Ravenshoun-park, Lewisham, Kent, S.E.</i>
1863	2070 Worms, George, Esq. 17, <i>Park-crescent, Portland-place, W.</i>
1845	Worthington, Rev. James, D.D. 27, <i>John-street, Bedford-row, W.C.</i>
1856	Worthington, J. Hall, Esq. <i>Alton-hill, Octon, near Birkhead.</i>
1866	*Worthington, Richard, G. 7, <i>Champion-park, Denmark-hill, S.</i>
1857	Wortley, Rt. Hon. Jas. Stuart, Q.C. 29, <i>Berkeley-sq., W.; and 1 Sheen, Surrey, S.W.</i>
1861	Wortley, the Hon. J. F. Stuart. 15, <i>Curzon-street, Mayfair, W.</i>
1866	Wotton, William G., Esq.
1863	Wright, John, Esq., C.E., F.S.A. 11, <i>Parl.-st., Westminster, S.W.; and Rochester.</i>
1839	*Wyld, James, Esq., M.P. <i>Charing-cross, W.C.</i>
1863	Wyld, W. H., Esq. <i>Foreign Office, S.W.</i>
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1854	Yeats, John, Esq., LL.D. <i>Clayton-place, Peckham, S.E.</i>
1861	York, Most Rev. William Thomson, Archbishop of. <i>Bishopsthorpe, York.</i>
1859	Yorke, Lieut.-General Sir Charles, K.C.B. 19, <i>South-st., Grosvenor-square, W.</i>
1830	*Yorke, Colonel Philip J., F.R.S. 89, <i>Eaton-place, S.W.</i>
1861	Youl, James A., Esq. <i>Wardah-house, Clapham-park, S.</i>
1857	*Young, Capt. Allen. <i>Riversdale, Twickenham, S.W.</i>

Year of  
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| 1838 | *Young, Charles Baring, Esq.        | 4, <i>Hyle-park-terrace</i> , W.  |
| 1866 | Young, Francis, Esq.                | 10, <i>Queen's-row</i> , <i>Grove-lane</i> , <i>Camden-rd</i> , S.      |
| 1830 | *Young, George Frederick, Esq.      | <i>Lincolne</i> , L.  |
| 1862 | 2090 Young, Sir Henry E. Fox., C.B. | 77, <i>Kensington-jardens-square</i> , W.                               |
| 1830 | *Young, James, Esq.                 |   |
| 1858 | Young, James, Esq.                  | <i>Lincolne</i> , <i>West Calder</i> , <i>Midlothian</i> .              |
| 1866 | Young, John, Esq., F.S.A.           | <i>Vanbrugh-fields</i> , <i>Blackheath</i> .                            |
| 1865 | Young, R. H., Esq., B.A.            | 22, <i>South-street</i> , <i>Durham</i> .                               |
| 1857 | Yule, Col. Henry, Bengal Engineers. | <i>Messrs. Grindley &amp; Co.</i> , 55, <i>Parliament-street</i> , S.W. |
| 1865 | Yule, Rev. J. W.                    | <i>Alexandria</i> , <i>Egypt</i> .                                      |
| 1864 | Zwecker, J. B., Esq.                | 37, <i>Torrington-avenue</i> , <i>Camden-road</i> , N.W.                |

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BOSTON . . . . .	American Society of Arts and Sciences	— . . . . .	— American Philosophical Society
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BRAZIL . . . . .	Historical and Geographical Institute of	— . . . . .	— Canadian Institute of
CHILE . . . . .	University of	WASHINGTON .	Congress Library of
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NAMES OF INDIVIDUALS TO WHOM THE ROYAL PREMIUMS  
AND OTHER TESTIMONIALS HAVE BEEN AWARDED.

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- 1831.—Mr. RICHARD LANDER, for the discovery of the course of the River Niger or Quorra, and its outlet in the Gulf of Benin.
- 1832.—Mr. JOHN BRIDGEMAN, for the discovery of the land now named "Enderby Land" and "Graham Land," in the Antarctic Ocean.
- 1833.—Captain Sir JOHN ROSS, R.N., for discovery in the Arctic Regions of America.
- 1834.—Sir ALEXANDER BURNES, for the navigation of the River Indus, and a journey by Balkh and Bokhara, across Central Asia.
- 1835.—Captain Sir GEORGE BACK, R.N., for the discovery of the Great Fish River, and its navigation to the sea on the Arctic Coast of America.
- 1836.—Captain ROBERT FITZROY, R.N., for the survey of the Shores of Patagonia, Chile, and Peru, in South America.
- 1837.—Colonel CHESNEY, R.A., for the general conduct of the "Euphrates Expedition" in 1835-6, and for accessions to the geography of Syria, Mesopotamia, and the Delta of Susiana.
- 1838.—Mr. THOMAS SIMPSON—Founder's Medal—for the discovery and tracing, in 1837 and 1838, of about 300 miles of the Arctic shores of America.
- Dr. EDWARD RÜPPELL—Patron's Medal—for his travels and researches in Nubia, Kordofan, Arabia, and Abyssinia.
- 1839.—Col. H. C. RAWLINSON, E.I.C.—Founder's Medal—for his travels and researches in Susiana and Persian Kurdistan, and for the light thrown by him on the comparative geography of Western Asia.
- Sir R. H. SCHOMBURGK—Patron's Medal—for his travels and researches during the years 1835-9 in the colony of British Guayana, and in the adjacent parts of South America.
- 1840.—Lieut. RAPER R.N.—Founder's Medal—for the publication of his work on 'Navigation and Nautical Astronomy.'
- Lieut. JOHN WOOD, R.N.—Patron's Medal—for his survey of the Indus, and re-discovery of the source of the River Oxus.
- 1841.—Captain Sir JAMES CLARK ROSS, R.N.—Founder's Medal—for his discoveries in the Antarctic Ocean.
- Rev. Dr. E. ROBINSON, of New York—Patron's Medal—for his work entitled 'Biblical Researches in Palestine.'
- 1842.—Mr. EDWARD JOHN EYRE—Founder's Medal—for his explorations in Australia.
- Lieut. J. F. A. SYMONDS, R.E.—Patron's Medal—for his survey in Palestine, and levels across the country to the Dead Sea.
- 1843.—Mr. W. J. HAMILTON—Founder's Medal—for his researches in Asia Minor.
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- 1846.—Captain CHARLES STUEB—Founder's Medal—for his various and extensive explorations in Australia.  
 ——— Dr. LUDWIG LEICHHARDT—Patron's Medal—for a journey performed from Moreton Bay to Port Essington.
- 1847.—Sir JAMES BROOKE, Rajah of Sarawak and Governor of Labuan—Founder's Medal—for his expedition to Borneo.  
 ——— Captain CHARLES WILKES, U.S.N.—Patron's Medal—for his Voyage of Discovery in the S. Hemisphere and in the Antarctic Regions, in the years 1838-42.
- 1848.—AUSTEN H. LAYARD, Esq., D.C.L. M.P.—Founder's Medal—for his contributions to Asiatic geography, researches in Mesopotamia, and discoveries of the remains of Nineveh.  
 ——— Baron CH. HUGEL—Patron's Medal—for his explorations of Cashmere and surrounding countries, communicated in his work entitled 'Kashmir und das Reich der Siek.'
- 1849.—Col. JOHN CH. FRÉMONT—Patron's Medal—for his successful explorations of the Rocky Mountains and California; and for his numerous Discoveries and Astronomical Observations.  
 ——— The Rev. DAVID LIVINGSTONE, of Kolobeng—a Chronometer Watch—for his successful explorations of South Africa.
- 1850.—Dr. GEORGE WALLIN, of Finland—25 Guineas—for his Travels in Arabia.  
 ——— Mr. THOMAS BRUNNER—25 Guineas—for his explorations in the Middle Island of New Zealand.
- 1851.—Dr. JOHN RAE—Founder's Medal—for his survey of Boothia and of the Coasts of Wollaston and Victoria Lands.  
 ——— Captain HENRY STRACHEY—Patron's Medal—for his Surveys in Western Tibet.
- 1852.—Mr. FRANCIS GALTON—Founder's Medal—for his explorations in Southern Africa.  
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—— Lieut.-Col. ANDREW SCOTT WAUGH, Bengal Engineers—Patron's Medal—for the Great Trigonometrical Survey of India.
- 1857.—Captain RICHARD COLLINSON, R.N.—Founder's Medal—for his Discoveries in the Arctic Regions.  
—— Prof. ALEX. DALLAS BACHE, Superintendant U. S. Coast Survey—Patron's Medal—for his extensive Surveys of America.
- 1858.—Captain RICHARD F. BURTON—Founder's Medal—for his Explorations in Eastern Central Africa.  
—— Captain JOHN PALLISER—Patron's Medal—for his explorations in British North America and the Rocky Mountains.  
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Hypsometrische Karte der Schweiz mit Text und Register. Von J. M. Ziegler. Winterthur, 1866. Scale 1 inch =  $8\frac{1}{4}$  geo. miles.

The AUTHOR.

Die Silvretta-Gebirgsgruppe nach Eidgenössischen Aufnahmen Excursionskarte des Schweiz Alpenklub für das Jahr 1865. Winterthur, 1866. Scale 1 inch = 0·68 geo. mile.

Prof J. M. ZIEGLER.

TURKEY—

Orographisch-Physikalische Karte von Kandia oder Kreta. nach den Aufnahmen von Kapitan F. Spratt, 1852. Scale 1:650,000, or 1 inch = 9 geo. miles. Von A. Petermann. Gotha, 1865.

A. PETERMANN, Esq., F.R.G.S.

ASIA.

ASIATIC ARCHIPELAGO—

Borneo.—North-West part of, from Observations made by Messrs. Low and St. John. A tracing. Scale 1 inch = 2 geo. miles.

*Maps, Charts, &c.**Donors.*

## BURMAH—

Map of Burmah and the Regions adjacent. By Capt. H. Yule, Bengal Engineers. London, 1857. On 2 sheets. Scale 1 inch = 28 geo. miles. JOHN ARROWSMITH, Esq., F.R.G.S.

Map of Trade Routes between Burmah and Western China. To illustrate Dr. C. Williams' Memorandum on the question of British Trade with Western China via Burmah. Calcutta, 1864. Scale 1 inch = 8 geo. miles.

British Burmah (Pegu Division). By Capt. Ferdinand Fitzroy, R.A. 1862. On 2 sheets. Scale 1 inch = 4 stat. miles, JOHN WALKER, Esq., F.R.G.S., Hydrographer to the India Office.

## CHINA—

Chinese Map of China. JAMES LOWTHER OUTHEY, R.N., F.R.G.S.

Military Plan of the Country round Shanghai, on a scale of 1 inch = 1½ mile. Sheets Nos. 22, 23, 26, 27, 28, 30, 31, 32, 34, 35, 36, 39.

Title and Index. On 2 sheets. Scale 1 inch = 5 miles. From Surveys made in 1862-5 by Lieut.-Col. Gordon, C.B., Major Edwardes, Lieuts. Sanford, Lyster, and Maud, R.E., Lieuts. Danyell and Bateman, R.M. 31st Regt., Assist. Eng. London, 1865.

ORDNANCE SURVEY OFFICE, SOUTHAMPTON,  
through Sir H. James, R.E., Director.

## INDIA—

The Great Trigonometrical Survey of India. 14 sheets: viz., No. 5, N.E. and S.E.; 6, N.E. and S.E.; 7, 17, 29, 105, S.E.; 106, 107, 114, 118, 119, and 120. Scale 1 inch = 3½ geo. miles. The INDIA OFFICE.

Map of India, showing the British Territories, subdivided into Collectorates, and including the Tenasserim Provinces, with the position and boundary of each Native State. By John Walker. London, 1860. On 6 sheets. Scale 1 inch = 28 geo. miles. PURCHASED.

Map of India, showing the Districts and Divisions, to illustrate Surveyor-General's Report of the Revenue Surveys, for Seasons 1858-9 to 1860-1. (Accompanied by Report.) By Lieut.-Col. H. L. Thuillier. Calcutta, 1862. Scale 1 inch = 96 stat. miles.

Map of India to illustrate General Report on the Topographical Surveys of the Bengal Presidency for Season 1862-63. (Accompanied by Report.) By Lieut.-Col. H. L. Thuillier. Calcutta, 1864. Scale 1 inch = 96 stat. miles.

Index to the Great Trigonometrical Survey of India, exhibiting in one view the Districts of Bengal, Madras, and Bombay Presidencies, the several series of Triangulation, and the Sections of the Indian Atlas to the Year 1860. Calcutta, 1863. Scale 1 inch = 96 stat. miles.

A small Map of India, revised and corrected to 1864. Calcutta. Scale 1 inch = 128 miles. Lieut.-Col. H. L. THUILLIER, Surveyor-Gen. of India.

*Maps, Charts, &c.*

A Set of Maps of India. By Lieut.-Col. H. L. Thuillier. Surveyor-General of India, consisting of 46 Maps, on 102 sheets. Viz.—

GENERAL MAPS.

No.	TITLE OF MAP	No of Sheets.	Scale.	
			Inch.	Miles.
1	Asia between parallels 20° and 60°. By Major J. T. Walker .. .. . 1862	1	1 =	115
2	India .. .. . 1865	1	1 =	128
3	Ganges, Country North of; Monghyr to Allahabad .. .. . 1858	1	1 =	8
4	Do. South of; Calcutta to Benares .. .. . 1859	3	1 =	8
5	Himalayan, sub-. Country; Ganges to Ravee .. .. . 1863	1	1 =	8
6	Kashmir Route Map .. .. . 1864	1	1 =	32
7	Khyrpoor, territory of H. H. Meer Ali Moorad .. .. . 1861	1	1 =	4
8	Oudh, the great trunk road. Benares to Delhi .. .. . 1857	2	1 =	8
9	Rajpootana and adjacent Country .. .. . 1846	8	1 =	8
10	Saugor and Nerbuddah Territories .. .. . 1861	2	1 =	8

DIVISIONAL MAPS.

1	Lahore Division, Punjab Proper .. .. . 1850-5	2	1 =	4
2	Mooltan do. do. do. .. .. . 1855-8	4	1 =	4
3	Sutluj, cis-. British and Native States .. .. . 1847-51	2	1 =	4
4	Sutluj, trans- .. .. . 1847-52	1	1 =	4
5	Umritsur .. .. . 1850-4	1	1 =	4

DISTRICT MAPS.

1	Bhurlpoor .. .. . 1855-8	1	1 =	4
2	Bunnoo and Derah Ishmael Khan .. .. . 1856-61	4	1 =	4
3	Burdwan .. .. . 1855-57	1	1 =	4
4	Bundelcund, Jhansee and Lulutpoor Districts .. .. . 1852-61	4	1 =	4
5	Derah Ghazee Khan, Lower Derahjat .. .. . 1856-9	3	1 =	4
6	Dihlee, Archaeological, &c. .. .. . 1849-50	8	1 =	0½
7	Gogaria (Punjab Proper) .. .. . 1853-6	6	1 =	2
8	Goojanwaluh (Punjab Proper) .. .. . 1852-5	2	1 =	2
9	Goojrat (Punjab Proper) .. .. . 1853-5	1	1 =	2
10	Jawud Neemuch .. .. . 1854-6	1	1 =	4
10*	Jhung, Punjab Proper .. .. . 1854-6	2	1 =	2
11	Jubbulpoor .. .. . 1854-62	1	1 =	4
12	Mooltan, Punjab Proper .. .. . 1845-8	6	1 =	2
13	Mozuffurgurh, Punjab Proper .. .. . 1853-7	6	1 =	2
14	Kangra .. .. . 1847-52	2	1 =	2
15	Shahpoor and Goojrat (Punjab) .. .. . 1853-9	1	1 =	4

PLANS OF CITIES, TOWNS, CANTONMENTS, &c.

			Cham-	
			Inch	Miles.
1	Bunnoo, Station and City .. .. . 1860-1	1	1 =	10
2	Burdwan, town, including Kunchunnuggur .. .. . 1856-7	4	1 =	12
3	Burrisaul, Civil Station .. .. . 1860-1	1	1 =	16
4	Calcutta, City and Environs, &c. .. .. . 1852-6	4	1 =	6
5	Cawnpoor Cantonments, Civil Station, &c. .. .. . 1852-4	2	1 =	8
6	Decca, City and Cantonments .. .. . 1859	1	1 =	12
7	Derah Ghazee Khan, City, &c. .. .. . 1858-9	1	1 =	8
8	Derah Ishmael Khan, City, &c. .. .. . 1859-60	1	1 =	8

Maps, Charts, &amp;c.

Donors

## PLANS OF CITIES, ETC.—continued.

No.	TITLE OF MAP.	No. of Sheets.	Scale Statute Miles.	
			Inch.	Miles.
9	Fureedpoor, Civil Station .. .. 1858-9	1	1 =	8
10	Hazareebaugh, Cantonment. &c. .. .. 1862	1	1 =	8
11	Kamptree, Cantonments .. .. 1858	1	1 =	8
12	Kashmir (Srinagar), City .. .. 1863	1	1 =	2
13	Nainee Tal, Zillah Kumaon .. .. 1848-50	1	1 =	8
14	Serampoor, Town and Environs .. .. 1863	1	1 =	16
15	Umballa, City and Cantonments .. .. 1850	1	1 =	20

By order of Right Hon. Sir CHARLES WOOD,  
Secretary of State for India.

Map showing the proposed Route of the Indus Valley Railway. By John Brunton, C.E., Chief Engineer, Scinde Railway. London, 1863. Scale 1 inch = 20 stat. miles.

North-Eastern Frontier of Bengal, including Sikkim, Bhootan, Assam, Garrow, Cossyah, Jynteah and Naga Hills, Dinajpoor, Darjeeling, Rungpoor, Sylhet, Cachar, Cooch-Behar, &c. By Lieut.-Col. H. L. Thuillier, Surveyor-General of India. Calcutta, 1865. On 6 sheets. Scale 1 inch = 7 geo. miles. THE INDIA OFFICE.

Sketch Map of the Mountain Regions adjacent to Punjab. To illustrate a Report upon Forests. By H. Cleghorn, M.D. 1864. Scale 1 inch = 17 stat. miles. CLEMENTS R. MARKHAM, Esq., F.R.G.S.

## RUSSIA IN ASIA—

Map of the Caucasus in Russian Characters. Scale 1 inch = 36 geo. miles.

Map of the Southern Parts of Eastern Siberia, with parts of Mongolia, Manchuria, and Saghalien. By M. Semenoff. Scale 1 inch = 92 geo. miles.

River Amur. On 7 sheets. By M. Schwartz. 1861. Scale 1 inch = 22½ geo. miles. Sir R. I. MURCHISON, Bart., K.C.B.

## TURKESTAN—

Plan von Samarkand und Umgebung. Nach der Russischen Aufnahme von Jakowlew. 1841. Scale 1 inch = 1 geo. mile.

A. PETERMANN, Esq., F.R.G.S.

## TURKEY IN ASIA—

Karte von Armenien, Kurdistan, und Azerbeidschan. By H. Kiepert. Berlin, 1858. On 4 sheets, Scale 1 inch = 14 geo. miles.

PURCHASED.

Karte von Klein-Asien. By H. Kiepert. Berlin, 1854. On 2 sheets. Scale 1 inch = 21½ geo. miles.

PURCHASED.

Map of the Holy Land; constructed by G. W. M. van de Velde. 2nd edition. Gotha, 1865. On 8 sheets. 6 copies. Scale 1 inch = 4½ geo. miles.

PURCHASED.

## AFRICA.

## North—

Original karte von Gerhard Rohlfs, Reisen in Central und Süd Marokko. (Atlas, Tafilet, Draa, &c. 1862 und 1864. Nach Rohlfs. Tagebuch und persönlichen Angaben mit Benutzung anderer Quellen gezeichnet von B. Hassenstein. Gotha, 1865. Scale 1 inch = 27½ geo. miles. A. PETERMANN, Esq., F.R.G.S.

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Originalkarte von Gerhard Rohlfs, Reise durch die Oasen von Tuat und Tidikelt und den Nördlichen theil des Tuareg-Gebietes (Nord Afrika) gezeichnet von B. Hassenstein. Scale 1 inch = 27.5 geo. miles. Von A. Petermann. Gotha, 1865. The Author.

*West—*

MS. Map of a portion of the River Niger, at the junction of the Binnue or Chadda, showing Dr. Baikie's Settlement of Lukoja. By Dr. Baikie. V. ROBINS, Esq., Deputy Governor of Lukoja.

*East—*

Übersichtskarte der Nilländer entworfen von H. Kiepert. Ethnographisch bearbeitet von R. Lepsius. Scale 1 inch = 70 geo. miles. Berlin, 1859.

Karte von Aegypten und der Sinai Halbinsel mit Benutzung der handschriftlichen hydrographischen Aufnahmen des Nithales von Linant de Bellefonds. By R. Lepsius and H. Kiepert. Scale 1 inch = 21 geo. miles. Berlin, 1859.

Karte von Aethiopien. By H. Kiepert and R. Lepsius. Scale 1 inch = 21 geo. miles. Berlin, 1859.

Karte vom Nil Delta dem Isthmus und dem Fayûm. By H. Kiepert and R. Lepsius. Scale 1 inch = 7 geo. miles. Berlin, 1859.

Karte des Nil-Thals in Mittel und Ober Aegypten und Unter Nubien oder vom Fayûm bis zur Zweiten Katarakte. By H. Kiepert and R. Lepsius. Scale 1 inch = 7 geo. miles. Berlin, 1859.

Karte der Ostaegyptischen Wüste zwischen dem Obern Nil und dem Arabischen Meerbusen nach den wegebeschreibungen von H. Kiepert und R. Lepsius. Scale 1 inch = 14 geo. miles. Berlin, 1859.

Routen in der Sinai-Halbinsel. By H. Kiepert and R. Lepsius. Scale 1 inch = 2.8 geo. miles. Berlin, 1859.

H. KIEPERT, Esq., F.R.G.S., through E. G. Ravenstein, Esq., F.R.G.S.

Consul Plowden's Original Map of part of Abyssinia, MS. Scale 1 inch = 8.9 geo. miles. The ROYAL GEOGRAPHICAL SOCIETY OF PARIS.

Ultimo Viaggio sul Fiume Bianco del Signor A. Debono, nel 1861. Scale 1 inch = 19 geo. miles.

Sources of the Nile, according to Alessandro VI., Pontif Max., 1492-1503. and Girolamo de Verazano (sic. XV.-XVI.), extrait de Fide Propagandæ Biblioth. 1861. Baron JOCHMUS.

Section in the line of the Murchison Rapids of the River Shiré.

Section of Gradient on River Zambezi from the Mouth to Sesheke.

From Barometric Observations by Dr. J. Kirk. 1861. The Author.

MS. Chart of Soundings taken in the Vicinity of the Entrance of the East Luabo River in February, 1862. By H. W. Inglis, Master of H.M.S. *Gorgon*. Scale 1 inch = 0.94 geo. miles. Dr. JOHN KIRK, F.R.G.S.

*South—*

Four Maps of South Africa. Viz.:—

1. Map of the Central Parts of Damara Land.

2. Map of Western Damara Land.

3. Prismatic Compass Triangulation checked by Latitudes of Western Damaraland.

4. Table of Latitudes, Variations of Compass, Height of Places above the Level of the Sea, &c.

By C. J. Anderson. Cape Town, 1866.

The Author.

A Manuscript Map showing the Route of Messrs. Chapman and Baines in South Africa, from Walfisch Bay to the Victoria Falls. Accompanied



Maps, Charts, &amp;c.

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by books of Astronomical Observations from their joint labours, drawn by Thomas Baines, Esq., F.R.G.S. Scale 1 inch = 8 miles.

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## AMERICA.

## UNITED STATES—

United States and Mexico, on 3 sheets. Viz.:—

1. Verein Staaten am Stillen Ocean.
2. ————— Atlantischen Ocean.
3. Das Kaiserreich Mexico 2 copies.

By E. G. Ravenstein. London, 1865. Scale 1:8,000,000, or 1 inch = 109.6 geo. miles. The AUTHOR.

Military Topographical Map of Eastern Virginia, showing the Routes taken by the several Army Corps, and the Battles fought in the present Campaign of 1864, under Lieut.-Gen. U. S. Grant. By Charles Sholl. New York, 1864. Scale 1 inch = 2.1 geo. miles.

Sir CULLING EARDLEY.

## WEST INDIES—

Map of Jamaica. By John Arrowsmith. London, 1864. Scale 1 inch = 5.5 geo. miles. The AUTHOR.

## South—

Karte von Sud America. By E. G. Ravenstein. London, 1866. On 2 sheets. Scale 1 inch = 164.3 geo. miles. Dr. MURIE.

Carta jeografica de los Estados Unidos de Colombia, Antigua, Nueva Granada, construida de orden del Gobierno Jeneral con arreglo a los trabajos corografica del A. Codazzi. Por Manuel Ponce de Leon. Bogota, 1864. On 4 sheets. Scale 1 inch = 18.4 geo. miles.

Carta geográfica plano del curso del Río Magdalena en la parte que puede ser navegada por buques de vapor. Trabajada por el ciudadano General T. C. de Mosquera. Barranquilla, 1849. Scale 1 inch = 10.2 geo. miles. General T. C. DE MOSQUERA, President.

Tracing of the Harbour of El Paylon (Province of Ecuador). Scale 1 inch = 0.83 geo. miles.

Registro Grafico de las propiedades rurales de la provincia Buenos Aires. Construido por el Departamento Topografico y publicado con autorizacion del Superior Gobierno de la Provincia 1864. Saturnino Salas. Mariano Moreuo. German Kuhr. Pedro Benoit Ygnacio Casagemas. Antonio E. Malaver. On 6 sheets (2 copies). Scale 1 inch = 5.94 geo. miles. Don SATURNINO SALAS, President of the Topographical Department, Buenos Aires.

## AUSTRALIA.

Map of Australasia. By J. and C. Walker. Scale 1 = 100 stat. miles.

Australien. By Augustus Petermann, Esq. Gotha, 1866. Scale 1 inch = 140 geo. miles. The AUTHOR.

Map of Australia, showing Routes of Modern Explorers.

————— Progress of Geographical Discovery to 1830.

————— to 1865.  
A. G. FINDLAY, Esq.

New Map of Queensland, compiled from Recent Surveys, showing Routes of Messrs. Jardine and J. G. Macdonald. By J. W. Buxton. Brisbane, 1865. Messrs. JARDINE, through the Colonial Office.

Maps, Charts, &c.

Donors.

Rough Eye-Sketch of the Adelaide River and adjoining Country from the Explorations of the Government Rest. Messrs. Auld and Litchfield. Scale 1 inch = 2 stat. miles.

Chart Map showing Explorations about Glenelg River, &c., up to 1864. Compiled in the Survey Office, Perth. Scale 1 inch = 7.4 geo. miles.

Chart showing Explorations about Roebuck Bay, &c., up to 1864. Compiled in the Survey Office, Perth. Scale 1 inch = 7.4 geo. miles.  
The COLONIAL OFFICE.

Map of the Overland Expedition under Messrs. Jardine to Cape York. On 6 sheets. By A. J. Richardson, Surveyor accompanying the Expedition, June 24th, 1865.

Messrs. JARDINE, through the Colonial Office.

NEW ZEALAND.

Geological Sketch Map of the Province of Wellington. By James Coutts Crawford, Esq., Provincial Geologist. Scale 1 inch = 8 stat. miles.

Geological Sections. Province of Wellington. By James Coutts Crawford, Provincial Geologist. Christchurch, New Zealand. 1865.

ATLANTIC OCEAN.

Chart of the North Atlantic Ocean, showing the Soundings obtained for Telegraphic purposes.

Chart of Deep-Sea Soundings in the North Atlantic from Ireland to Newfoundland. By Lieut. J. Dayman, R.N., H.M.S. *Cyclops*. 1857.

The HYDROGRAPHIC OFFICE, ADMIRALTY

INDIAN OCEAN.

MS. Map of the Lagoons of Madagascar. By Capt. W. Rooke, R.A. Scale 1 inch = 10 geo. miles.

Carte de l'Île Maurice. Par A. Dardenne. Port Louis, 1862. Scale 1 inch = 1.8 stat. mile.  
Lieut. OLIVER, R.A.

Generalkarte der Nicobaren. By Commodore B. v. Wüllerstorff-Uibair, S.M. frigate *Nourra*. 1858. Scale 1 inch = 6 geo. miles.

CHARTS.

BRITISH ADMIRALTY CHARTS—

Section 1.

- No. 44 Drogheda to Carlingford (Ireland, East Coast).
- 60 Alderney and the Casquets (Channel Islands).
- 1426 Lochs Linnhe, Leven, Abor, and Eil (Scotland).
- 1828 The Downs (England, East Coast).
- 1934 River Tyne (Entrance to).
- 2390 East and West Lochs, Roag (Hebrides).
- 2475b Hebrides or Western Islands.

Section 2.

- No. 2751 Spitzbergen.

Section 4.

- No. 725 Harbours of Guetaria, Rivadesella, Ria de Tina Mayor, and S. Vincente de la Barquera.
- 726 Luarca and Luanco Harbours. Ria de Pravia.

*Maps, Charts, &c.**Section 5.*

- No. 148 Port Mahon (Minorea Island).  
 155 Gulf of Spezzia (Italy, West Coast).  
 189 Trapani to Marsala (Sicily, West Coast).  
 206 Channels of Corfu with the adjacent Coast of Albania.  
 251 Cape Carbon to Fratelli Rocks (Africa, North Coast).

*Section 6.*

- No. 299 Harbours and Anchorages, West Coast of Newfoundland.  
 302 Knife Bay to Cape Anguille do. do.  
 342 Port Metway to Lunenburg (Nova Scotia).  
 637 Little Port and York Harbour (Newfoundland).  
 712 Cow Head Harbour (Newfoundland).  
 743 St. George Harbour (Newfoundland, West Coast).  
 1711 Hillsborough River (Prince Edward Island).

*Section 8.*

- No. 446 Jamaica Island (West Indies).  
 499 Port Castries (St. Lucia Island).

*Section 9.*

- No. 535 San Marcos or Maranham Bay (Brazil).  
 544 Santa Catharina Island and Strait.  
 2522 ————— to Rio de la Plata.

*Section 11.*

- No. 364 Duncan Bay and Metlah Catlah Bay.  
 569 Esperanza to Clayoquot (Vancouver Island).  
 571 Harbours in the vicinity of Queen Charlotte Sound.  
 583 Quatsino to Esperanza (Vancouver Island).  
 589 Esperanza and Nuchathitz Inlets (Vancouver Island).  
 590 Klaskino and Klaskish Inlets (Vancouver Island).  
 592 Barclay Sound (Vancouver Island).  
 602 Roche Harbour and its approaches (Vancouver Island).  
 611 Griffin Bay and adjacent anchorage (Vancouver Island).  
 630 Port Neville (British Columbia).  
 634 Port Harvey (British Columbia).  
 714 Oyster and Telegraph Harbours (Vancouver Island).  
 1907 Sooke Inlet (Vancouver Island).  
 1916 Nootka Sound (Vancouver Island).  
 1917 Vancouver Island and British Columbia.  
 2431 Cordova Bay to Cross Sound, including Koloschiusk Archipelago (North America, West Coast).  
 2545 Monterey and Santa Barbara Harbour (California).

*Section 12.*

- No. 71d Madras to Point Calimere (India, East Coast).  
 709 Priaman to Oujong Indrapoera (Sumatra).  
 2413 Rhio Strait (China Sea).  
 2761 Sumatra, West Coast (Sheet 2).

*Section 13.*

- No. 854 Part of Swatow (China, East Coast).  
 911 Amboina, Cajeli, and Saparoea Bays.  
 957 Ports in the Philippine Islands.  
 961 Basilan Channel (Sulu Sea).  
 971 Semirara, Ylin, and Ambolon Islands (Philippine).  
 972 Looc and Paluan Bays and Loog and Romblon Ports.  
 976 Manila Bay (Philippine Islands).  
 2347 Preliminary Chart of Japan, &c.  
 2405 The Kuril Islands from Nipon to Kamchatka.  
 2407 Ports and Harbours in Russian Tartary.  
 2441 Strait of Tsugar (Japan).

*Maps, Charts, &c.*

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- 2454 Island of Luzon (Northern portion).  
2577 St. Bernardino Strait (Philippine Islands).

*Section 14.*

- No. 363 Keppel Bay and Islands (Queensland).  
403 Woody Point to Lowly Point (Australia, South Coast).  
404 Riley Point to Woods Point (Australia, South Coast).  
624 Hobson Bay and River Yarrow (Australia, South Coast).  
1025 Tacking Point to Solitary Island (Australia, East Coast).  
1026 The Solitary Islands and adjacent Coast.  
1171a and b Port Phillip (2 sheets).

*Section 15.*

- No. 191 Mboli Harbour (Solomon Islands).  
741 Nairai and Mbatiki Islands (Fiji Group).  
742 Ono, Simonoff, and Michaeloff (Fiji Group).  
1105 Cape St. George to Cartaret Point (New Ireland).  
1247 Matuku Island and Harbour (Fiji Group).  
1249 Ovalau and Moturiki (Fiji Group).  
2421 Tonga or Friendly Islands (Pacific Ocean).

*Section 16.*

*See Accessions to Library.*

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**FRENCH—**

- No. 2027 Ports et Mouillages de la Terre de Feu (No. 4).  
2028 ————— du Canal Sta. Barbara.  
2029 ————— de la Terre de Feu (No. 1).  
2049 Détroit de San Bernardino (Mer de Chine).  
2050 Partie Orientale de la Mer de Soulou et de Mindoro d'après les documents les plus récente.  
2058 Carte particulière des côtes d'Italie (partie comprise entre la Tour Patria et la Cap Sottile).  
2060 Carte du Canal compris entre la côte est de l'île de Chypre et la côte de Syrie.  
2100 Îles Viti (Océan Pacifique).  
2101 Passes du Port d'Auckland (Nouvelle Zélande).  
2102 Plan de la côte Nord-Est de Terre-Neuve (partie comprise entre le Cap Vent et le Havre de la Conche).  
2103 Mouillage de Maceio. Embouchure du Rio San Francisco do Norte (Brésil).  
2104 Plan de Fénéry (côte Est de Madagascar).  
2105 Carte du Canal San Roque, et de la côte comprise entre le Cap San Roque et le Cap Tubarao.  
2106 Carte de la Rivière du Pei-ho (Gulf du Pe-tche-li).  
2107 Plan de l'embouchure du Rio Congo ou Zaire.  
2108 Balisage des Récifs de la Floride (Etats Unis).  
2109 Mer du Corail.  
2110 Détroit de Belle Île (Terre Neuve).  
2111 Port de Kagosima (Japon. Île Kiusiu).  
2112 Plan du Havre de Cap Rouge (Terre Neuve).  
2113 Carte du Détroit de Messine (Italie Méridionale).  
2114 Carte du Bassin compris entre l'île de Cuba, la Jamaïque, le Honduras, et le Yucatan.  
2115 Carte du Golfe d'Aden de Ras Addah à l'entrée de la Mer Rouge.  
2116 Plan de la Baie de l'Aiguillon (France).  
2117 Ports dans la Canal Ku (Japon).  
2118 Entrée ouest de Seto Uchi et détroit de Simonoseki.  
2119 Port de Nagasaki (Japon, Île Kiusiu).  
2120 Côte de Tunis d'Africa aux Roches Fratelli.

*Maps, Charts, &c.*

- 2121 Carte du Golfe de Khabes ou Petit Syrte.
- 2122 Carte de la partie de la Méditerranée comprise entre la côte d'Italie du Canal de Piombino. au Golfe de Naples la Corse, et la Sardaigne.
- 2123 Mer de Soulou et partie occidentale de la Mer des Celebes du Déroit de Macassar au Nord de l'Archipel de Soulou.
- 2124 Ports et Mouillages dans Seto Uchi ou Mer Intérieure du Japon.
- 2125 Carte de la Côte Occidentale d'Amérique comprise entre le Golfe Tehuantepec et le Golfe de Guayaquil.
- 2126 Mer Rouge (4<sup>ème</sup> Feuille).
- 2127 ———— (3<sup>ème</sup> Feuille).
- 2128 ———— (2<sup>ème</sup> Feuille).
- 2129 ———— (1<sup>ère</sup> Feuille).
- 2130 Carte des débouquements de St. Dominique et des Passages à l'est de Cuba (Mer des Antilles).
- 2131 Plan de Barre de Lisbonne.
- 2132 Golfe de Yeddo (Japon. Ile de Nipon).
- 2133 Seto, Uchi ou Mer Intérieure (Japon).
- 2134 Embouchure du Congo (Côtes Occidentales d'Afrique).
- 2135 Carte de la côte comprise entre le Cap Gracias a Dios et Santa Marta (Mer des Antilles).
- 2136 Carte de la Nouvelle Zélande.
- 2137 Carte de la Côte Ouest de l'Amérique Méridionale comprise entre la Baie Pisco de Labos d'Afuera (Pérou).
- 2138 Côte Ouest du Pic de Monganui au Port de Manukan. Côte Est du Port de Tutukaka a l'Ile Mayor comprenant le Golfe de Hauraki (Nouvelle Zélande).
- 2139 Carte de l'Amérique Septentrionale (Côte Orientale, partie comprise entre New York et le Cap de la Floride).
- 2140 Plan du Havre du Pot d'Etain (Côte Nord-Est de Terre Neuve).
- 2141 Plan du Havre d'York (Côte Ouest de Terre Neuve).
- 2142 Carte de la côte d'Egypte comprise entre el Arish et Damiette.
- 2143 ———— Alexandrie et Damiette.
- 2144 Carte du Déroit de Macassar.
- 2145 Madagascar (Côte Orientale), partie comprenant l'île Fong. Tamatave. Foulpointe, Fénériver, et St. Marie.
- 2146 Carte de la partie Septentrionale comprise entre l'entrée du Canal de la Floride et les Bouches du Mississippi (Golfe du Mexique).
- 2147 Golfe du Mexique. Carte de la partie Nord-Ouest comprise entre les Bouches du Mississippi et la Barre de Santander.
- 2148 Carte routière de la côte du Brésil de l'embouchure de l'Amazone à Ceará.
- 2149 Carte de la Mer de Java (Partie Orientale).
- 2150 Carte des Iles et Mers du Japon.
- 2151 Carte de la partie du Grand Archipel d'Asie compris entre Java, la Nouvelle Guinée, et l'Australie.
- 2152 Camaran Mer Rouge).
- 2153 Plan du Havre de Boutitou (Côte Nord-Est de Terre Neuve).
- 2154 Plans de la Mer Rouge (Feuille 1<sup>ère</sup>).
- 2155 ———— (Feuille 2<sup>ème</sup>).
- 2156 ———— (Feuille 3<sup>ème</sup>).
- 2157 ———— (Feuille 4<sup>ème</sup>).
- 2158 Hâvre des Trépassés (Côte sud de Terre Neuve).
- 2159 Hâvre de Plaisance (Côte sud de Terre Neuve).
- 2160 Baie et Port Bradore (Golfe St. Laurent) et Baie Rouge (Déroit de Belle Ile).
- 2161 Port Basque (Côte sud de Terre Neuve).
- 2162 Ile Scatari et Baie Menadou (Ile Cap Breton).
- 2163 Hâvre de Bonne Esperance (Golfe St. Laurent).

*Maps, Charts, &c.*

*Donors.*

- 2164 Havre de Belles Amours, Middle Bay, &c. (Golfe St. Laurent).
- 2165 Baie Sainte Anne (Ile du Cap Breton).
- 2166 Ports de Burin (Côte sud de Terre Neuve).
- 2167 Baie d'Halifax (Nouvelle Ecosse).
- 2168 Carte de la côte de Syrie comprise entre l'île Ruad et le Cap Carmel.
- 2169 Carte de la Manche (Lighthouses).
- 2170 Carte des Sondes à l'Ouest de La Manche, comprenant la côte S. O. d'Irlande, la Grande et la Pte. Sole.
- 2171 Golfe Persique (Feuille Occidentale).
- 2172 ————— (Feuille Orientale).
- 2173 Carte de la Navigation entre le Mer du Nord et la Méditerranée, de Dunkerque à Marseille.
- 2174 Carte de la Mer d'Okotsk.
- 2175 Havre de Grace (Terre-Neuve, Baie Conception).
- 2176 Ile du Cap Breton (Golfe St. Laurent).
- 2177 Plan de l'île de Hong Kong (Mer de Chine).
- 2178 Carte des côtes Méridionales et Occidentales d'Irlande de Carnsore Pt. à Bengone Head.
- 2179 Carte de la côte Méridionale de l'île de Chypre.
- 2180 Port Sydney (Ile Cap Breton, Golfe St. Laurent).
- 2181 Rivière de Guayaquil (Amérique Méridionale).
- 2187 Plan du Mouillage de Campêche (Golfe du Mexique).
- 2202 Port de Louisbourg (Ile du Cap Breton).
- 2206 Baies de Kingstown, Greathead, et Calliqua (Ile St. Vincent, Petites Antilles).

DÉPÔT DE LA MARINE FRANÇAIS.

MISCELLANEOUS.

Geographical View of Sardinia and the Plains of Lombardy from Turin to the Adriatic. By Edward Stanford. London, 1866.

The AUTHOR.

Original Model of the Victoria Falls (South Africa). Constructed by Thomas Baines, Esq. Scale 1 inch = 100 yards.

Two original Oil Paintings of the Victoria Falls:—

1. View of the Great Western or Main Fall.
2. Herd of Buffaloes chased to the edge of the Chasm opposite Garden Island.

Painted by T. Baines, Esq.

The ARTIST

Two original Oil Paintings of the Victoria Falls:—

1. View from the West End of the Chasm.
2. Profile Cliffs and Narrow Gorge of the Lower Zambesi.

Painted by T. Baines, Esq. 1866.

PURCHASED.

Eight Photographic Views of Scenery in South Africa, taken by J. Chapman, Esq.; and one Photographic View of a Model of the Victoria Falls constructed by T. Baines, Esq.

T. BAINES, Esq.

London.—Meteorological Diagram showing the daily elements throughout the year 1865. By C. O. F. Cator, M.A. Scale 1 inch = 10 days.

The AUTHOR.

A List of Distances between Great Barmen and Elephant Fountain, taken by by a trochameter, accompanied by a Map, by Mr. H. E. Bary.

T. BAINES, Esq.

C. GEORGE, Map Curator.

## INSTRUMENTS LENT TO TRAVELLERS.

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To the late MR. I. DUNCAN, Vice-Consul at Whydah, in 1849—

Telescope.  
Two Compasses.  
Aneroid Barometer.

DR. P. C. SUTHERLAND, M.D., F.R.G.S., at Natal—

Brass Sextant (7½-inch), with Silver Arc, by Troughton and Simms.  
Strong-framed Artificial Horizon . . . . .  
Two Barometers (Mountain), . . . . . nan.

The late DR. E. I. IRVING, M.D., F.R.G.S., at Abeokuta—

Pocket Chronometer, by Barraud and Lund.  
Barometer (Mountain), by Troughton and Simms.

DR. D. LIVINGSTONE, M.D., F.R.G.S., Zambesi, Eastern Africa—

Sykes's Hypsometrical Apparatus, No. 1, with Sling Case, by Casella.  
Standard Thermometers, 0 to 212, in Brass Cases, "  
" in Maroon Cases, "  
Artificial Horizon, with Sling Case, "  
Prismatic Azimuth Compass, silver ring, with leather Sling Case, "  
Rain Gauge.

DR. D. WALKER, M.D., F.R.G.S., Russian America, Dec. 8, 1862—

Sextant, 4 in. radius, by Cary.  
Artificial Horizon, Circular, by Cary.  
Azimuth Compass, by Elliot.

The late MONS. JULES GRAND, Upper Guinea, towards Timbuktù, Feb. 4, 1863—

Sextant, 3-inch radius, by T. Jones.  
Aneroid, white metal, by Spencer, Browning, and Co.  
Artificial Horizon, spirit-level, by Elliot.  
Boiling-water Apparatus, and three Thermometers in brass tubes  
Azimuth Compass, by Burner.  
Two small Pocket Compasses.  
Protractor, brass, 2-in. radius.

(The above in Leather Case)  
Measuring Tape, 50 feet.  
Thermometer, on metal, in Morocco Case.  
Protractor, horn, circular.

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# PRESENTATION

## OF THE

# ROYAL AWARDS.

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THE Founder's Gold Medal to Dr. THOMAS THOMSON, M.D., F.R.S., for his labours in exploring the Western Himalayas and Tibet, and for his highly valuable work thereon, published in 1852, in which he described, for the first time, the true physical geography of those regions, as well as the botany, geology, and the former and present glacial action in these lofty mountains. The Patron's or Victoria Gold Medal to Mr. WILLIAM CHANDLESS, M.A., for his recent unaided exploration of the River Purûs, from its mouth on the River Amazons nearly to its sources, a distance of 1866 miles, and for laying down the course of this previously undefined great stream by a continuous series of astronomical observations of latitude and longitude and compass bearings.

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The PRESIDENT addressed the meeting as follows:—

“ GENTLEMEN,

“ In previous Addresses to the Royal Geographical Society I have dwelt so emphatically upon the value of the researches and work of Dr. Thomas Thomson, that my associates can well suppose the award of the Founder's Medal to this distinguished man has given me the truest satisfaction. Eminent among living naturalists, Dr. Thomson, in the course of his arduous expedition, in which Botany was his chief object, traversed a large tract of wild and mountainous country hitherto unexplored, crossed for the first time the dividing range of the great Asiatic continent, brought back collections that link the labours of the Russian botanists in the north with those of the English in the south, and carefully laid down every feature in the Physical Geography and Geology of the vast elevated region whence the Indus and its tributaries take their rise, amid perpetual glaciers and at enormous heights above the sea.

“ Another rare merit is, that he embodied these researches in



a work which, whether for modesty of style, accuracy, as well as breadth of view, or as being the first to demonstrate the true physical structure of the mountain masses of North-Western India and trace their water systems, climate, and productions, must be considered as of the highest value by naturalists, geographers, and geologists.

"To Dr. Thomson we owe the final abandonment of an idea long prevalent, and which was entertained even by my illustrious friend Humboldt, that Tibet was an elevated plain or plateau; and with this fell also many subsidiary theories relating to the snow-line, glaciers, temperature, and climate of Central Asia. In short, from the date of Thomson's researches, rational superseded conjectural geography as regarded that vast and still to a great extent unexplored area.

"These are not merely my words—they are those of that eminent naturalist, Joseph Hooker, whose explorations in the Eastern Himalayas rival those of Thomas Thomson in the West. They were also the matured opinions of the late distinguished and ever-to-be-regretted Edward Forbes.

"Not content with his exertions in the North-West, Thomson applied, on their completion, for leave to explore the Eastern Himalayas, and for this purpose joined Dr. Hooker in Sikkim, spending a year and a half there, and in the Khasia Hills of Eastern Bengal, before he returned to Europe on furlough.

"Now, when I inform you, my associates, that for all these devoted and important services Dr. Thomson never received any reward, nor even public thanks, but, on the contrary, was left to publish his work at his own cost and to his heavy loss, you will all rejoice with me that, although we have much too long delayed our gift, we have at last placed ourselves in a befitting position by rendering justice and all honour to such a distinguished man."

The PRESIDENT then addressed the Medallist in these words:—

"Dr. THOMSON,

"The opinions which are expressed in the brief estimate of your merit which I have just read, will find, I am sure, an echo not merely in this Society, but in every scientific body of Britain and her colonies. Let me assure you that, often as it has fallen to my lot to present our Medals to men distinguished for their boldness of adventure, I can bring to mind no occasion in which intrepidity and perseverance were more happily united with high scientific acquirement than they were in your own person, when you carried out those admirable researches for which we gratefully offer you our highest honour.

"I have, indeed, a peculiar pleasure in placing this Medal in your hands in the presence not only of some distinguished botanists of our own country, but also of foreign botanists, headed by that eminent man, M. de Candolle; for I am certain they feel as strongly

as I do, that the researches of the Botanist and the Geographer are essentially bound up together, as indeed the great results obtained by Humboldt, Robert Brown and others, as well as by yourself, have abundantly demonstrated."

Dr. THOMSON replied:

"SIR,—I have no words to express my sense of the very unexpected honour conferred on me, through you, by the Royal Geographical Society. Its value is, if possible, much enhanced by the very flattering manner in which you have been so good as to speak of my humble services to geography. As we all know, a traveller in new or little known countries finds in the success of his explorations an ample reward for all his toils: I scarcely expected that the observations I made should be remembered at all after so many years. It is therefore especially gratifying to me to find that they are regarded as of importance by such high authority. I beg to thank you again most cordially for the honour you have conferred on me."

M. DE CANDOLLE then rose, and in a few words expressed his great satisfaction at being present when the highest reward of the Royal Geographical Society was bestowed on a botanical traveller. He corroborated the statements of the President, with regard to the high value of the researches of Dr. Thomson in the Western Himalayas and Tibet, which, in conjunction with those of Russian *savants* in the North, had thrown great light on the Botanical Geography of inner Asia.

The PRESIDENT next addressed himself to Mr. Cecil Long, the brother of the recipient of the Victoria or Patron's Medal:—

"MR. LONG,

"The brilliancy and completeness of the geographical exploit of your brother, Mr. William Chondless, in tracing by his own unaided exertions the whole course of the River Purús, one of the longest of the tributaries of the Amazons, so impressed my colleagues of the Council of this Society, that he was at once fixed upon as meriting one of the Gold Medals of the present year. I can truly say that in this decision I entirely concurred. The Purús has been, from nearly the foundation of this Society, a river in which we have taken the greatest interest, and the memoirs which have been published upon it in the volumes of our Journal have testified to the importance and the difficulty of obtaining a correct knowledge of the course and direction of a stream known to be of great magnitude and navigability. Accounts had been published, showing the almost insurmountable nature of the obstacles to the exploration of the river in Southern Peru, supposed to be the upper portion of the Purús, and information had reached us of several unsuccessful attempts on the

part of expeditions despatched by the Brazilian Government to ascend it from its mouth. Our surprise and gratification may, therefore, be well conceived when we received the news that an English private gentleman, travelling in South America for the pure love of science, had applied himself unostentatiously to the solution of this geographical problem, and had been completely successful. He had qualified himself for such an undertaking by previous travels in different parts of both South and North America, particularly by his exploration of the River Tapajos, an account of which he communicated to this Society in 1862, and by his journey across North America, as narrated in a work he published, entitled 'A Visit to the Salt Lake.' And now, providing himself with suitable instruments for surveying, and embarking with only one servant in a small canoe of the country manned by Indians, he ascended the great river for 1866 miles, and has sent us as a result of his work a map of its whole course, projected by himself with great minuteness from his own observations. Not content with this first arduous survey, he resolved to ascend the river a second time, and explore its principal tributary with a view to settle the question of its supposed connection with the rivers of Southern Peru: and I rejoice to hear that he has returned successful from his second voyage, and has mapped the tributary with the same minuteness as he had previously done the main stream.

"I cannot but admire the boldness with which such undertakings have been conceived and the skill with which their results have been worked out. The great danger encountered in travelling for months through a country of interminable forest, in which lurk hordes of savage Indians, is shown in the treacherous slaughter of your brother's servant and his boat's crew in descending the river. The result of Mr. Chandless's survey has been the laying down a vast tract of country previously unexplored, and a profound modification of all our maps of the interior of tropical South America. I entrust this well-earned mark of the esteem of Geographers to you, Sir, in the hope that you as well as ourselves may be gratified with the safe return of your brother, on the termination of his self-imposed labours."

Mr. LONG then spoke as follows:—

"Sir R. MURCHISON,—On behalf of my brother, William Chandless, I accept with heartfelt pleasure the Gold Medal that the Royal Geographical Society have conferred upon him: for it is a testimonial from this great and important body, that they admire the zeal and energy displayed by my brother in his explorations, and set a high value upon the results of his labours. Although, indeed, with him they have been labours of love, undertaken and prosecuted with no desire of reward, but simply for the love of geographical investigation. In truth, so little does my brother anticipate what

is passing here to-day, so humble is his estimate of the interest that will be taken here in his discoveries—that in his last letter from the Amazons, written since his return from his recent visit to the River Aquiry, he says, ‘I shall probably send a paper of five or six pages about it to the Royal Geographical Society; but one must not try their patience too far.’ And, Sir, if anything could add to my pride and pleasure on this occasion, it would be the warm approval with which the learned and distinguished audience around me received the kind words with which you presented me this Medal, and the sketch you gave of my brother’s career and travels, making them clear to all your hearers by the powerful aid of your own profound knowledge. To you, Sir, and, through you as President, to the Royal Geographical Society, I beg on behalf of my brother and myself to tender our warmest thanks. I regret exceedingly that he is not here to-day, to vindicate, in language more appropriate than I can command, and especially by the simple relation of his story, the choice of the Society. But it will be my duty to transmit to him, in South America, a faithful record of this day’s proceedings. And I shall hope hereafter to be the vehicle of conveying to the Royal Geographical Society my brother’s grateful thanks for the honour they have conferred upon him and his high appreciation of their approval.”

A testimonial, value 100 guineas, was then presented to M. du Chaillu, to reimburse him for the loss of his instruments in Western Africa, and as a testimonial of the importance of his services in making numerous astronomical observations to fix positions, which have much improved the cartography of the region he explored.

In presenting the testimonial, the President thus spoke :—

“M. DU CHAILLU,

“I have expressed to the Royal Geographical Society, on more than one occasion, my admiration of the zeal with which you fitted out your last expedition, and of the devotion with which you endeavoured to carry it out. I congratulate you on having demonstrated the truthfulness of your former observations, particularly as relates to the Natural History of the region you explored, and for the many good astronomical observations which have enabled you to construct a more correct map of the country near the coast.

“Your bold and perilous endeavour to penetrate into the heart of Africa from the West Coast merited our warmest thanks: and, had it not been for the unfortunate accident which at once put an end to your advance, and nearly proved fatal to yourself, I have no doubt that you would, at no distant day, have won the same honours which have been conferred upon a Barth, a Livingstone, a Burton, a Speke, a Grant, and a Baker.

“Accept, then, this token of our regard, and view it as a mark of our approbation and as an incentive to future exertion.”

M. DU CHAILLU replied as follows :—

“ Sir RODERICK and Gentlemen,—Allow me to thank you for the generous manner in which you have spoken of my past labours. I accept this testimonial as a proof of the interest which the Council of the Royal Geographical Society take in my attempts to penetrate the unknown region of Equatorial Western Africa. I can only say I wish I had done more; but it has been my lot, as all true geographers well know,—and I say it without wishing to arrogate any undue credit for myself,—to have for my task the exploration of the most difficult field in the whole of Africa. On almost every other side of the continent there has existed trade, and caravans of traders, from the coast into the interior, which have in some degree opened the way to travellers; but inland from the Fernand Vaz and Gaboon no trader has ever been farther than a few miles, and the interior is a region of mountains and impenetrable forests. Notwithstanding, I succeeded in penetrating about 400 miles, and shall ever regret the accident which prevented me from going farther. In conclusion, permit me, Mr. President, to thank you for the kind feelings you have always entertained towards me.”

A gold watch, value 26*l.* 5*s.*, was awarded to Moola Abdul Medjid, for the service he has rendered to geographical science by his adventurous journey from Peshawer to Kokand, along the upper valley of the Oxus and across the Pamir Steppes.

The PRESIDENT, in presenting the watch, stated that Sir Henry Rawlinson, who had proposed this award in the Council, and who would have been the most fitting person to receive it on this occasion, was unavoidably absent. He trusted, however, that Lord Strangford would fulfil this duty, as he had entirely participated in the feelings and opinion of Sir Henry. He would therefore place it in his hands, in the hope that, through Sir Henry Rawlinson and the Indian Government, he would have the watch conveyed to the excellent native observer who had so well earned it. It had been stated that such gifts as these, from time to time, would stimulate a superior class of our Indian subjects to make further explorations of this nature, and be otherwise productive of much good. He therefore had great pleasure in bestowing this award.”

Lord STRANGFORD said :—

“ Gentlemen,—As Sir Roderick has informed you, the award of this watch was proposed in our Council, and I fully concurred in the proposal; but I regret that the duty of receiving it has, through accident, fallen upon me. Sir Henry Rawlinson is a better representative of Asiatics than I can hope to be. I feel, however, much gratification in acting on the present occasion, as represen-

tative man on behalf of so vast and in some respects so highly civilised a community as our Indian subjects. I think that the present occasion is one of something more than geographical significance. It is a matter of very great importance to find so good an occasion to bind that community to us by scientific as well as political links. To us as geographers it is a great advantage to have the means of exploring countries inaccessible to Europeans, in the co-operation of these meritorious native travellers. I beg leave, in the name of Moola Abdul Medjid and of the native community of India, to return thanks for this testimonial to the President and to the Society.

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# A D D R E S S

TO THE

## ROYAL GEOGRAPHICAL SOCIETY.

*Delivered at the Anniversary Meeting on the 28th May, 1866,*

By SIR RODERICK IMPEY MURCHISON, BART., K.C.B.,

PRESIDENT.

GENTLEMEN,

In this the twelfth Address which I have had the privilege of delivering to you, I have still the satisfaction of announcing that our Society is advancing in prosperity and flourishing with undiminished vigour. I have also once more to congratulate you on that which was a new feature last year—the issue of the annual volume of the Journal long before our Anniversary. This result is entirely due to the zeal and devotion of our Assistant-Secretary, Mr. H. W. Bates; and when you consider the additional labours he has to undergo in also editing the voluminous records of our Meetings and in conducting much ordinary business, you will unite with me in offering to him our hearty thanks.

If, during a large portion of the Session that has passed, we lost the services of our Senior Secretary, Mr. Clements Markham, it will be my pleasing duty, in another part of this Address, to call your attention to the highly important services he has rendered to his country during his recent journeys through various parts of British India. His place has, as you know, been well filled *ad interim* by Mr. Major, who, now that, to my great regret, we lose the services of Mr. L. Oliphant on account of his parliamentary duties, will, I trust, be elected by you to occupy the vacant place.

As at the last Anniversary, I will not attempt to treat of all the varied topics which have been under your consideration during the past Session, but will touch upon those subjects only which

have most interested me. These general observations, as on former occasions, will be preceded by a record of the lives of our deceased Fellows, as well as by a review of the Admiralty Surveys, as prepared by the Hydrographer, which important document necessarily takes a prominent place on such an occasion in this maritime country.

## OBITUARY.

I naturally commence the record of our deceased Associates by a short notice, however imperfect, of the life of the illustrious English statesman, whose death on the 18th October last produced a thrill of sorrow throughout the nation.

As the leading events in the life of Lord PALMERSTON form a large portion of the history of this century it would be quite out of place were I now to attempt to enter upon so vast a theme. I will, therefore, simply advert to those features of his character which marked his acquirements and his love of science, as well as to those traits of goodness and heartiness which so endeared him to a large circle of friends and admirers.

In early life he was educated at Harrow School, and truly any of us who have seen him on the Speech days riding from London to his old school and back, when he was approaching his 80th year, may well say that he was a brave Harrow boy to the last.

In the next phase of his education I rejoice as a Scotsman to reflect upon the fact, that at the University of Edinburgh, and under the tuition of Dugald Stewart, Playfair, and other eminent men, the mind of young Henry Temple was stored with that solid and practical knowledge on which much of his future success depended. Next, at Cambridge he attached himself so earnestly to mathematical studies, that throughout life the solution of a problem was with him quite a natural process, which, in eliciting a new train of thought, relieved that official drudgery which he adopted as a fixed rule, and ever adhered to with unswerving perseverance.

I may, indeed, add, that when a new discovery in Chemistry or Physics was made, he always endeavoured to master the subject, showing, by his sagacious questions, how deeply he had reflected upon the information communicated to him orally by some scientific friend, when the pressure of public business prevented his reading the memoirs in which such discoveries were described.\*

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\* This fact, particularly in relation to the great discovery of the spectrum analysis, and some of the recent researches of M. Foucault, was communicated to me by my friend Sir Henry Holland, the President of the Royal Institution.



In perusing the terse and well-reasoned despatches, or in listening to the speeches of Lord Palmerston, I always felt that it was to the scientific superstructure reared at Edinburgh and Cambridge upon the classical groundwork of Harrow, that this eminent man mainly owed his superiority over most of his contemporaries. Logic and method were always combined in him with ready wit and unflinching good humour.

His long administration of Foreign Affairs necessarily led him to take a deep interest in Geography, but particularly in the boundaries and territorial rights of nations, as secured by treaties or established by legitimate national exertions. Of all researches in distant parts, he was most attached to those made in Africa, inasmuch as throughout life he was forward, resolute, and unflinching in every measure which led to and carried out the abolition of the Slave-trade. Hence it was that the good Livingstone has told me, that he considered Lord Palmerston to be the most firm and genuine philanthropist he had ever known, and for that reason had dedicated to him his last work on Southern Africa. Whilst on this point let me say, that if Lord Palmerston were alive I feel certain that, with his anxious desire to ameliorate the condition of the negro races by introducing lawful commerce into their prolific country, teeming as it does, particularly on the West Coast, with produce of great value, he would have continued to sustain the recently-formed pioneer establishment on the Niger, which, under the direction of our lamented associate, Dr. Baikie (whose death I dwelt upon last year), has attained to so high a degree of prosperity. Recently, indeed, we have seen that able naval officer, Commodore Wilmot, who has so long commanded on the West African coast, lamenting bitterly over the suggested abandonment of all the advantages we had obtained, accompanied, as he states, by the prospect of returning to the former state of barbarous warfare among the native tribes, in lieu of a peaceable and profitable traffic by which they were rising in the scale of humanity.

From frequent personal intercourse with the late Premier, I can testify that he had the sincerest desire to advance every branch of science. Thus the acquirements of his youth enabled him to shine forth conspicuously in the year 1846, when he attended the meeting of the British Association at Southampton, over which I presided, and when he spoke eloquently and energetically in favour of that great institution in presence of the Prince Consort. Again, whether in granting to the Royal and other scientific Societies apartments in

Burlington House, including the very Hall in which I now address you, or in lending a willing ear to the claims of impoverished men of science and their families, he was ever our true and enlightened patron.

Let me add that Lord Palmerston was an assiduous and untiring man of business, to which, when Foreign Secretary, he devoted from eight to ten or even twelve hours a day. His constant practice, as one of his oldest associates has told me, was to sketch out a reply to every despatch of note as he read it; and in these sketches there was seldom any erasure or alteration. His style of writing was singularly direct, logical, and lucid, and his language the purest English. The handwriting was as muscular and bold as the matter was plain and intelligible. There was no mistaking either, though he thought and wrote with prodigious rapidity.

Lord Palmerston had a great facility for acquiring languages. At his own table you might hear him speaking to foreigners successively in French, Italian, and Spanish, with perfect fluency and a remarkably correct pronunciation.

When at Broadlands after a Parliamentary campaign he still stuck to official business with unflagging assiduity and tenacity, devoting to it hour after hour. In the afternoon, and when sporting friends were there, he would join in shooting, enlivening the party with many a good story. At other times he would ride a good distance to meet the foxhounds, and then follow them better and straighter than most of his younger associates. For, when in his saddle, Lord Palmerston was truly a premier among horsemen, his hand being as fine as his seat was firm. It was quite impossible for him to remain inactive, and when his public business was settled, and hunting or shooting were not the order of the day, he would row on the clear river Test, which flows by Broadlands, or look over his young racing stud, or take a long and fast ride on one of his high-bred roadsters. In the evening, when in the country, it was his habit to play a game or two of billiards, though he invariably returned to his official boxes for a revision of his papers before he retired to rest. With all his devotion to work, nobody enjoyed social intercourse more than Lord Palmerston; and those who have had the privilege of his acquaintance and have witnessed the joyousness communicated to the circle around him by his genial flow of conversation, aided as it was by the grace of the charming lady who so deeply mourns his loss, will unite with me in declaring that his residences in town and country were

centres of attraction, such as we cannot hope to see equalled in this generation.

Lastly, it is my pride to remind you, that during a long, eventful, and successful career, he ever adhered to and supported his friends of all classes with cordial sincerity; and it was this feature in his character, united as it was with undaunted public spirit and frank and open manners, that justly rendered Lord Palmerston so cherished a favourite of the British nation.

WHEWELL.—By the recent fatal accident which caused the death of Dr. William Whewell, the late Master of Trinity College, Cambridge, the world of science and letters has lost one of its brightest ornaments, while his large-heartedness endeared him to numerous friends, among whom I was proud to be numbered.

It is for others more competent than myself to dilate upon his almost universal acquirements; and, leaving it to the President of the Royal Society to notice his numerous contributions to physical science, I will treat only of the character of my lamented friend in some of those aspects of the philosopher with which I have been familiar.

Endowed with the most capacious grasp of intellect, it was the resolute will and energy of Whewell which, elaborating the advances made by numerous observers and philosophers past and present, gave him so strong a hold upon the minds of his contemporaries. When the British Association was founded in 1831, it was through his suggestion to the Rev. W. Vernon Harcourt, the eminent lawgiver of that great Institution, that the system of publishing Annual Reports on the various branches of Science was adopted. At the first Cambridge meeting of that body (1833), when he was a Tutor of Trinity College, I can affirm that, to his unbounded zeal, untiring perseverance, and methodical arrangements, the success of the meeting was as much due, as it was to the eloquence and popularity of his senior, Professor Sedgwick. It was then, indeed, quite apparent that, if Whewell should live, a quarter of a century would not pass over without producing rich and fruitful results. The versatility of the genius of the man has been demonstrated not merely in his various publications, but also in the offices which he successively held; for, capable as he was of unfolding and explaining the most elaborate arguments of the metaphysician as Professor of Casuistry, we next find him lecturing on Mineralogy, and bringing all his mathematical knowledge to bear upon Crystallography.

It was the high position which he took up as a mineralogist which induced the Geologists to place him at their head; and, after presiding over the Geological Society of London during two years, he left behind him in his Addresses a series of broad views which connect Geology in a masterly manner with many other branches of Natural History: whilst his masculine eloquence had the happiest effect in marking out for his associates the future bearing of their researches. In truth, he was so rich in accomplishments that he was well qualified to preside over any scientific Society. Nay, more, we may well extend the capacities he possessed to art—at least to antiquities and architecture, for in these departments he was equally an adept.

In addition to his sterling knowledge in science as well as classical lore, Whewell had a warm poetical verve, as proved by his composition of a collection of English hexameter verses. He further possessed great facility with his pencil, in delineating, not only the forms of architecture, but also the features of a landscape. In the last-mentioned accomplishment I shall ever remember the rapid but truthful sketch which, in a few minutes, he made in my presence of the Wren's Nest near Dudley,—a sketch which I published in the '*Silurian System*.'\*

Amid his almost countless employments, those persons only who have closely watched his career are aware that, in the years 1826 and 1828, while occupied with Professor Airy in ascertaining the density of the earth by observations carried on in the deepest mines of Cornwall, "he lived (as he tells us himself) for four months the life of a labouring miner."†

Among his numerous qualifications it is now, however, my special duty to affirm that our deceased associate was a sound Geographer. His strong point, indeed, was the world known to the ancients, but he also took the most intense interest in every new discovery in remote regions, and in every addition to our knowledge made by distant travellers.

Again, he continually endeavoured to aid the advance of our science by contributions of a high intellectual cast, as proved by his remarkable memoir on the Tides, published in the '*Philosophical Transactions*.' Although not a contributor by name to our volumes, it is further my duty to honour his memory by stating

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\* See p. 485, also '*Siluria*,' p. 131.

† See the end of his address as President of the British Association at the Plymouth Meeting, Report of 1841.

that several passages in my own works relating to the power of waves of translation and currents, are from the pen of this untiring writer, who not only found time to produce works of sound classification, and to direct the affairs and government of a great College, but also to assist any friend who he saw was struggling to enunciate important physical truths, of which the writer felt the value, but could not express them with the lucidity and power of a Whewell.

Recurring to the Addresses which he delivered to the Geological Society, we find in them the same clear definitions of the branches of that science as those which he affixed to other divisions of the sciences. His separation, for example, of all geological works into great classes, "Descriptive" and "Dynamical," and his vivid perception of the imperishable truths which were being chronicled in the first-mentioned of these classes, afforded, as I can testify, great comfort to those of us who were then gathering together positive data, which we hoped might be hereafter regarded as established landmarks. On the other hand, when he dwelt upon what he termed "Geological Dynamics," his writings show that he clearly saw what a struggle would ensue, and how long it would continue, between speculators who compared the grand ancient revolutions of the surface of the globe with the changes of which history affords us any examples. It was he, indeed, who first proposed the names which have since been affixed to the two great classes of geologists, "Catastrophists" and "Uniformitarians." In reference to these names I may state from my own knowledge that Whewell agreed with Buckland, Sedgwick, Von Buch, Humboldt, myself, and many others, that the vast oscillations which took place between land and water in very remote periods, as well as the abrupt dislocations, and often inversions on a vast scale, of the strata composing mountain masses, were only to be explained by operations of far greater intensity than those of which mankind have ever had any examples, and at the same time that many of these are phenomena wholly inexplicable by any amount of drift upon time.

But, as I am addressing Geographers, I must now offer an explanation, which would not be required were this Address delivered to my brother Geologists. In speaking of Uniformitarians, as Whewell defined those geologists to be, whose leader is my eminent friend Lyell, the worthy inheritor of the mantle of Hutton and Playfair, let it not be supposed that any reasonable geologist, certainly not myself, who may dwell upon the great and sudden dislocations which he believes the crust of the earth underwent from time to time in

far bygone periods, is not also a strenuous advocate of an uniformity of causation as respects the enormously long and undisturbed periods required to account for the accumulation of the thick sedimentary deposits. On the other hand, unbiased Uniformitarians now admit of occasional catastrophic action: and, as the question is thus reduced to be one of degree only—that degree to be fairly gauged by measuring the relations and extent of the ruptures of the crust of the earth—I feel confident that out of fair discussion the exact truth will ultimately be obtained.

In the last of his Geological Addresses, Dr. Whewell told his auditors, that he considered the great theorizers of the past as belonging to the fabulous period, whilst he flattered the hard-working field geologists of our day by saying, that “the men who were around him belonged to the heroic age of geology, and that it was the destiny of the science to pass therefrom to the historical period.” Now, after a lapse of twenty years since these words were spoken, this is just the transition which is now taking place. We may therefore treasure up this saying of a man whose occupations through life had been to trace the principles and laws by which the progress of human knowledge is regulated from age to age in each of its provinces, and to estimate its future advance.

When, indeed, those who were intimate with Dr. Whewell look back to the state of the University of Cambridge when he was in his fullest vigour, and had for his contemporaries a Sedgwick, a Herschel, a Peacock, an Airy, a Henslow, and a Hopkins, we may well talk of that as the heroic age of science, since we can scarcely expect to see again, at any one time, so many great minds rivalling each other as were then the teachers of British youth in the famous University of Newton.

In his exhaustive essay on the ‘Principles of English University Education,’\* it is refreshing to find how successfully Whewell maintains the necessity of instructing the youth as equally and essentially in classical knowledge as in mathematics, the physical sciences, and modern languages; and, referring back to the earliest standard examples of poetry, eloquence, history, criticism, grammar, and etymology, he thus writes:—“All the civilized world has been one intellectual nation, and it is this which has made it so great and so prosperous a nation. All the countries of lettered Europe have been one body, because the same nutriment, the literature of

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\* Parker, Strand, 1837.

the ancient world, was conveyed to all by the organization of their institutions of education."\* And this is said by the mathematician who by some was considered to be too exclusive a favourer of those scientific studies which have elicited the noblest results of modern intellect!

No one, indeed, can read the peroration of this remarkable essay without being warmed by the generous enthusiasm of the man who, in sustaining the true value of English University Education, looked to its right administration as "involving the welfare of countless generations of Englishmen yet unborn, and of centuries of English civilization yet only in the germ."

Proud of the great College in which he had been reared, and of which he was so many years the Master, it is pleasing to record that Whewell applied during his life large sums of money to the erection of new halls, whilst, in addition to many acts of munificence, his death was marked by a kindly consideration of his successor (whoever he might be) in the Mastership, and to whom he bequeathed the chief contents in the interior of Trinity Lodge. Let me here add, that if his manners were occasionally abrupt, there never was a more kindhearted being; and it was this inbred quality which so endeared him to all his old friends.

Having heard it said that, great as was the Master of Trinity, he lacked inventive genius, I cannot close this brief and imperfect record of his merits without offering a set-off to this criticism. For, though the name of Whewell is not enrolled among those who have had the good fortune to be illustrated by great discoveries in science, he has done that for scientific research which leads many into the paths of discovery. Like the illustrious Bacon, the first great teacher of inductive philosophy, and with a similar comprehensive survey of the intellectual world, he has pointed out at once the direction in which science has hitherto moved, as well as that which is hereafter to be the line of its advance, and thus has reared for himself a solid memorial of his eminence.

Admiral WILLIAM HENRY SMYTH, C.B., who was taken from us in September last, at the age of seventy-seven, was distinguished as an astronomer and an antiquary, as well as a geographer,—acquirements rarely united in the person of one who in his early career had been so conspicuous for his gallantry in the naval service of his country. A record of those public services is given in the Anniversary Report

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\* 'English University Education,' p. 35.

of the Royal Astronomical Society. The important point on which I have first to comment is, that during the war which ended in 1815, he was signalised not only by various acts of devotion and courage, but also by carrying on, when only a Lieutenant in the Royal Navy, an extensive series of hydrographical observations between Sicily and the coasts of Italy and Africa. For this service he was promoted to the rank of Commander. Whilst his full and striking description of Sicily and the adjacent islands was published in 1824, he was actively engaged in completing his hydrographical surveys in the Mediterranean, in which he was continuously occupied during ten years, displaying so much ability and accuracy that he fairly won for himself the name of “Mediterranean Smyth.” It was during these surveys that he collected antiquarian relics from the ruins of Lepti Magna, in Barbary; and it was also in these years that he matured that love for astronomical observation which clung to him through life, the most striking proof of which was the establishment, at his own cost, of an observatory at Bedford. Those persons who, like myself, visited him when he had just completed that building, have a lively recollection of the zeal with which he was supported in carrying out his views by that highly accomplished lady his wife.

His equatorial refractor being one of the first constructed in this country, and which had attached to it all the improved apparatus and adjustments of that day, he was enabled by it to make a series of observations of the highest value: and continuing those after his instruments had been transferred to Hartwell, the residence of Dr. Lee, he published his ‘Cycle of Celestial Objects’ in 1844, including his Bedford Catalogue; and for this work he was rewarded with the gold medal of the Astronomical Society. After that period, we learn from the truthful sketch of his life by Mr. Isaac Fletcher, F.R.S., that he continued his astronomical labours with untiring zeal to near the close of his valuable life. That friend and brother astronomer, supported in his opinion by such authorities as Herschel and Airy, has well said of Admiral Smyth, that as a geographer, a hydrographer, a numismatist, and an antiquary, he was equally distinguished as in astronomy, by the depth of his inquiry, his untiring industry, and the sagacity of his deductions.

It is, however, in this hall that I claim to speak specially of our departed associate as a geographer who was thoroughly entitled to preside over us, whilst it is peculiarly gratifying to me to remind you, that to no one of our leaders do we owe a

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truer debt of gratitude than to Admiral Smyth. Though he was not the actual founder of our Society, as explained in my address of last year,\* it is certain that in the very year of our origin Admiral Smyth sketched out the project of a Geographical Society, and had absolutely enrolled many good men in furtherance of it. To the conduct which he pursued during his presidency, in the years 1849-50, I hesitate not to repeat, what I expressed when I succeeded him, is due the first step in advance which led to our present prosperous condition. Such was the energy and ability with which he brought our geographical ship into trim, that when he handed her over to me I had little more to do than to let her run before the favouring breeze which my gallant friend had taken advantage of, and by which he had steered us, with such ability and tact, towards a safe haven.

Among the numerous good services which he willingly rendered to me in the performance of my duties, it gave me pleasure to state that the feeling notice of the life and death of his brother officer, the late Duke of Northumberland, as published in my last Anniversary Address, was from his pen, and it evidently came from the heart of the man whose loss we now mourn.

It was impossible to know Admiral Smyth, and to mark the zeal and fidelity with which he carried out every object at which he aimed, without feeling that he was one of the finest types of the old British seaman. The celebrated Captain John Smith, who was termed "the saviour of Virginia," the grandfather of our deceased associate, lost all the fortunes of the family by his adherence to the Royal cause in North America; and this is just what our lamented Admiral would have done if placed in a like position, so truly loyal was he in heart and conduct.

Beloved by a very numerous circle of friends, and respected in every scientific and literary Society to which he belonged, Admiral Smyth has bequeathed a spotless and honoured name to his sons, one of whom is now worthily the President of the Geological Society, and another the Royal Astronomer in Scotland; whilst his devoted widow can reflect with just pride on those astronomical achievements of her gifted and excellent husband in which she bore no inconspicuous a part.

Sir William Jackson HOOKER, K.H.—This eminent botanist, who for more than half a century had occupied a prominent place in

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\* See 'Journal,' vol. 35, p. cxxvii. note.

science, and who throughout his long career laboured incessantly for its furtherance, died at Kew on the 13th August last, in his eighty-first year. Sir W. Hooker's whole heart was given to the advancement of Botany, but in promoting its progress he also rendered many important services to Geography. As the Presidents of other scientific Societies, particularly the Linnean, will doubtless place on record his many claims to a high rank among botanists, it would be out of place on my part to enumerate the long series of his works which have borne testimony to the wide range of his knowledge, the ready skill of his pencil, the energy of his character, and to the perseverance with which he worked on till the very end of his meritorious life. It must be my object to glance at his career chiefly as it bore upon our own science, and to note what Geography has gained by his labours.

Descended from a family already boasting of more than one illustrious name, W. J. Hooker was born at Norwich on the 6th of July, 1785. Succeeding, as soon as he came of age, to a competency left him by his godfather, he was able to gratify his taste for travelling and science without the necessity of adopting a profession. Having in his youth enjoyed the friendship of three very eminent zoologists, Kirby, Spence, and Macleay, his first choice was Entomology and Ornithology, on the study of which he entered with all the enthusiasm of his character. Fortunately for Botany, Sir J. E. Smith, the then President of the Linnean Society, was also a Norwich man. With him Hooker was brought into intimate communication by the fortunate accident of his discovery for the first time in Britain of a peculiar moss, the *Buxbaumia aphylla*. Smith introduced him to Dawson Turner, of Yarmouth, an eminent cryptogamist, whose daughter he afterwards married. The love of Botany, thus accidentally developed, grew rapidly under the fostering care of these eminent men, and under the fascinating influence of that precious Linnean Herbarium, of which Sir James Smith was the fortunate possessor. Thenceforward devoting himself entirely to Botany, Hooker soon set before himself as his main object the formation of a herbarium—an ambition which, as is well known, he ultimately realised with a completeness of success far exceeding anything he could have thought possible at the beginning of his career.

To extend the Herbarium, his lengthened tours in Scotland in 1807 and 1808, extending to the Orkneys and Hebrides, were followed by a voyage to Iceland, made at the suggestion of Sir Joseph Banks, himself an Icelandic traveller. Unfortunately for science

Mr. Hooker lost all his collections and most of his notes through the destruction by fire of the vessel in which he was returning—a calamity from which he only escaped with life by the fortunate presence of another vessel close at hand. His 'Recollections of a tour in Iceland,' published at Yarmouth, though prepared, as the title declares, mainly from memory, may even now be consulted with advantage for the narrative, as well as for much careful research.

Having thus personally explored Scotland and Iceland, he was next led to take a special interest in the Arctic and Scandinavian flora; for just at that time the first of the many explorations by land and sea in search of the North-West Passage was made. He thus became the intimate friend of Parry, Franklin, Richardson, Beechey, and James Ross, all of whom entrusted to him for publication their botanical treasures brought from those icy regions.

In 1814 the opening of the Continent enabled Hooker to make an extended tour through France, Switzerland, and Northern Italy; and in 1820 he went to Glasgow as Professor of Botany, where he remained for twenty years. During that period he was an admirable teacher, exciting in his pupils the highest enthusiasm by the animating style and clearness of his lectures, and still more by the annual excursions to the Highlands, in the course of which he never failed to convey to those who accompanied him a portion of his own love of Nature and her works. Glasgow was then, as it is now, an important medical school, and the number of graduates very large; all were required to attend a course of Botany, and many studying with great zeal, acquired among other things a love of exploration. Numbers entered the army, navy, and Indian medical service, or sought other positions in foreign countries. To all of these Sir William Hooker was ready to lend a helping hand, guiding their studies while pupils, and furthering their interests afterwards, well satisfied to be repaid by a share of their collections, the labour of publication often devolving upon him. Although in all this his first object was Botany, yet that science being intimately related to Geography, the furtherance of the one science led necessarily to the advancement of the other, and thus zealous botanists of his own training were successively spread almost broadcast over the face of the globe. Besides Dr. Clarke Abel, who at his recommendation became the naturalist to Lord Amherst's embassy to China, I may name, amongst his other pupils who rendered good service to Geography, Gardner, the Brazilian traveller, Scoules, who explored

North-West America, as well as Douglas and Drummond, both naturalists attached to Arctic expeditions. Above all, let me name our medallist of this year, Dr. Thomas Thomson, the explorer of the Western Himalayas, and Dr. Joseph Hooker, the son of my deceased friend, so well known as an antarctic voyager and for his admirable work on the Eastern Himalayas, and who has worthily succeeded his excellent father as Director of the Royal Gardens of Kew.

Nor was Sir William Hooker's foreign correspondence confined to his former pupils. Indefatigable as a letter writer, and strictly punctual in reply, he attended to all who applied to him for information, and thus knew everything which was done in his favourite science all over the world. He was, therefore, from an early period referred to by those who had scientific appointments in their gift, and indeed even when not referred to was wont, as I can testify, to watch every proposed geographical expedition and to urge upon the authorities the importance of attaching to it a naturalist. In his great knowledge of the vegetable productions of our colonies originated the happy idea of that great work, the 'Colonial Floras,' the first part of which was his own 'Flora Boreali-Americana.' Other parts, such as those of Ceylon and Hong Kong, are finished, and those of the Cape of Good Hope and Australia are now in progress, and the whole, it may be hoped, will be completed before many years elapse. Though none of these, except the first part, were his own work, he looked on them all with parental interest, for they originated in his own suggestion and were sanctioned by the Crown on his urgent representation of their importance.

It was in 1840 that Sir William Hooker left Glasgow for Kew, where for a quarter of a century he laboured most successfully in the development of the Royal Gardens, without allowing his other labours in the least to flag. What these gardens now are we all know; but to appreciate fully his merits we must recollect, as I well do, what they were when he took charge of them. We may, indeed, truly say that no more enduring memorials of his life could be desired than these noble grounds, that magnificent winter garden, though still unfinished, and the splendid museums, full of vegetable treasures from all parts of the world.

Universally beloved at home, Sir William Hooker was also honoured and esteemed in many foreign Societies in which science is cultivated, and they rejoiced to bestow on him their honorary distinctions. As Director of the Royal Gardens at Kew, he was of

pre-eminent service to Botany through the independent action which, much to the honour of our Government, he was allowed to exercise in the management of that great and attractive national establishment. Supported by adequate grants of the public money, he invariably used them with solid judgment and good taste; thus demonstrating by the works he has left behind him, that the best, if not the only true method of advancing any branch of science, is to entrust its management to a well-skilled responsible chief, and not to embarrass and dwarf it by affiliation with other and alien divisions of the public service, of which, owing to a habit of bureaucratic organisation of our so-called "Departments," there are in this country some striking examples.

Without enumerating his numerous foreign titles, I may state that, in addition to a knighthood of the Guelphic order, conferred on him by William IV., Sir William was a Fellow of the Royal, Linnean and Royal Geographical Societies, and was most worthily honoured by the University of Oxford with the distinction of Doctor of Civil Laws.

Sir John RICHARDSON, C.B.—The Society has lost another of those eminent men who have distinguished themselves in Arctic discovery. John Richardson, the intrepid companion of Franklin, was born at Dumfries in the year 1787, and educated at the grammar school there until he reached the age of fourteen, when he was transferred to the University of Edinburgh. Entering the Royal Navy as assistant-surgeon in 1807, his first service was in the *Nymph*, which vessel accompanied Lord Gambier's fleet to Copenhagen; and he was in the boats of that ship when they attempted to cut out a French brig, under Belem Castle, in 1808, in which affair Captain Shirley was killed. In consequence of his conduct on this occasion he was made surgeon, and appointed to the *Hercules* of seventy-four guns. In 1809 he was transferred to the *Bombay*, and served in that ship at the siege of Tarragona: afterwards as surgeon to the 1st battalion of Marines he was with Sir G. Cockburn in the operations on the coast of Georgia, and was present at the capture of a fort and the taking of the town of St. Mary's.

In May, 1819, he was selected to accompany the Polar land expedition under Sir J. Franklin. After venturing on the great Slave Lake, the Coppermine River was descended in frail birch-bark canoes, and the coast of North America explored to the eastward  $62\frac{1}{2}^{\circ}$ , as far as Cape Turnagain. The record of hardship and privation experienced upon their return voyage will be familiar to most of you,

and nobly did Richardson play his part on this trying occasion. In the introduction, indeed, to the account of the voyage, Franklin pays this tribute to his assistance. "To Dr. Richardson the exclusive merit is due of whatever collections and observations have been made in the department of Natural History, and I am indebted to him in no small degree for his friendly advice and assistance in the preparation of the present narrative."\*

In the second expedition of Franklin, 1825 to 1828, to Dr. Richardson was entrusted the exploration of that portion of the Arctic Sea between the Mackenzie and the Coppermine rivers, a distance of 902 miles, while Franklin proceeded along the coast to the westward, and reached a spot within 160 miles of Icy Cape (the limit of Captain Cook's discovery). The geographical results of these two expeditions may be thus summed up:—The exploration and delineation of the northern shore of the American continent throughout 40 degrees of longitude, comprising an extent of coast-line amounting to nearly 2000 miles. But it was not geography alone that was benefited by their labours, for the meteorological and magnetical observations, taken with a faithfulness and perseverance that demands the greatest praise, combined with those collections in the department of Natural History, which, while taking a share in the labour of his companions, were the especial vocation of Richardson, rendered the account of these voyages especially interesting to the scientific world; and the publication of that excellent work, the '*Fauna Boreali-Americana*,' proved how well qualified he was for the position he had been selected to fill. In 1838 Dr. Richardson was appointed Physician, and in 1840 Inspector of Haslar Hospital; in consideration of his eminent services, he was made a Companion of the Bath, and received the honour of Knighthood in 1846.

When in 1848 it became necessary that succour should be sent to his former chief, Sir John Franklin, Richardson again came forward, not only with his valuable advice and experience, but with personal service; and in company with Dr. Rae descended the Mackenzie, and traversed the Arctic shore between that river and the Coppermine, an account of which was published in 2 vols. in 1851. His assistance to the subsequent searching expeditions by the preparation of pemmican and antiscorbutics, and the advice respecting clothing and equipment, were undoubtedly of great service, and possibly the means of saving many lives.

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\* See Franklin's '*First North-Polar Expedition*.'

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After his retirement from active service Sir John settled at Grassmere, and, as will be seen in the list of his works in the foot-note,\* took a prominent part in the promotion of science; and after an honourable and useful career, terminated an active life of industry on the 5th of June, in the 78th year of his age, and to the deep regret of his numerous associates in the Royal, Linnean and Geographical Societies, in all of which he was most highly esteemed.

Finally, let me say of my valued friend that all his scientific work bears the impress of his character. It is painstaking, honest, sagacious, and without pretension; a most trustworthy repertory of carefully and intelligently observed facts.

In his official relations, Richardson presented to superiors as to inferiors the same simple dignity, inflexible determination to do what he considered right, and great administrative energy in carrying out that determination. A certain, not inappropriate, Arctic ruggedness coated the exterior of the man, and perhaps interfered with his reaching the highest post which he was eminently qualified to occupy, as occasionally it may have led young and inexperienced juniors to think him cold and unsympathetic. But sooner or later his subordinates found that Sir John had silently taken the measure of their tastes and capacities, and, when an opportunity presented itself, was ready to advance their interest in a spirit of most genial and thoughtful kindness. One eminent naturalist† has told me, that he owed what he has to show in the way of scientific work or repute to the start in life thus given him by Sir John Richardson. In short, by an union of sagacity and energy with a warm heart, he was a fine type, I am proud to say it, of the foremost class of Scotsmen.

DR. BARTH.—By the death of Dr. Henry Barth, the great African traveller, we have lost a distinguished medallist of this Society, and a geographical explorer of world-wide fame. Born at Hamburg in 1821, he died at Berlin in 1865, in his forty-fourth year. Those who wish to trace the detailed progress of this remarkable man

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\* *List of Works by Sir J. Richardson*.—Fauna Boreali-Americana, 2 vols. folio, 1829 to 1836. Report on North American Zoology, 8vo., 1837. On the Frozen Soil of North America, 8vo., 1841. Zoology of the 'Sulphur's' Voyage (Fish.), 1843. Zoology of the 'Samarang's' Voyage (Fish.), 1848. Boat Voyage through Rupert's Land and the Arctic Sea, 2 vols. 8vo., 1851. Zoology of the Voyage of the 'Herald' (Fossil Mammals), 1852. Notes on Natural History (Belcher's last of the Arctic Voyages), 1855. Hygiene as a branch of Military Education (in the Transactions of the Social Science Association), 1858. Yarrell's History of British Fishes (new edition), 1859. Polar Regions (in the Encyclopædia Britannica), 1859. Polar Regions, 1861. Museum of Natural History (Glasgow), in connexion with others, 1859 to 1862.

† Professor Huxley.

should peruse the account of his life, as given by Dr. Koner of Berlin. Educated thoroughly in a knowledge of the classical authors of antiquity, he from an early age began to take the deepest interest in African geography, when he read with keen relish the works of our countrymen Mungo Park, Lander, and others. After acquiring the degree of Doctor in the University of Berlin, he made, in the years 1845 to 1847, coast journeys along the southern or African shores of the Mediterranean, a full account of which was afterwards published at Berlin (1849). In 1853 he communicated to our Society an account of his more extensive expeditions; and in 1857, when a resident in London, he completed that masterpiece of all his labours, entitled '*Travels in North and Central Africa*,' in 5 vols., being the result of all the researches he had made, when associated with Richardson, with Overweg, with Vogel, and lastly by himself alone and undaunted.

It was for this original work that the Royal Geographical Society awarded to Dr. Barth its highest honour, and placed him in the limited list of its Foreign Associates; for although he made no observations to fix with astronomical accuracy the latitude and longitude of places, the reckoning of the distances he travelled over was so accurately and minutely laid down, and his chronometer so studiously observed, that he was enabled to add much to cartography, whilst his description of the countries he traversed, and the inhabitants he came in contact with, was most telling and effective.

Since that time, following the steps of his eminent countryman, Carl Ritter, Dr. Barth has been the life and soul of the Geographical Society of Berlin, by bringing before that body the accounts of the travels of all African explorers, including Du Chaillu, Speke and Grant, Munzinger, Beurmann, Baikie, Vogel, Duveyrier, Schweinfurth, von der Decken, G rhard Rohlfs, and others. He also made two journeys in the interior of Turkey, accounts of which are given in the '*Zeitschrift f r allgemeine Erdkunde*' of 1863, in which work, as in the '*Mittheilungen*' of Petermann, and in the volumes of the German Oriental Society, will be found a list of his numerous publications.

The chief work by which Dr. Henry Barth will be remembered is that to which I have already alluded, and which he published under the auspices and by the assistance of the British Government. In it he develops how, by his indomitable perseverance and skilful researches, he was enabled, for the first time, to lay before the world



the true character of a vast extent of wide and hitherto untrodden lands between Timbuctoo and the Niger. It was specially for these labours that we rejoiced to honour him by giving him our medal; and we were equally rejoiced when our gracious Sovereign conferred on him a Companionship of the Bath.\* A more intelligent, indefatigable, trustworthy, and resolute traveller than Dr. Barth can rarely be found, and we all deplore his untimely end at the early age of forty-four.

FÖRCHHAMMER.—John George Förchhammer, who died at Copenhagen on the 14th December last in his 73rd year, was a justly popular and highly esteemed Foreign Member of our body, as well as of the Royal and Geological Societies of London. The son of the Rector of the school at Husum, in Jutland, he studied chemistry and pharmacy at Kiel, under Phaff, afterwards made an excursion to the Harz to see the small smelting-furnaces of Goslar, and subsequently, at the University of Copenhagen, he largely profited by the lectures on physics of the illustrious Ørsted. In 1820 he became a Doctor of Philosophy; his inaugural treatise being on the acid and superacid of manganese. Lecturing continuously, whether on the manufacture of porcelain, or on chemistry and mineralogy, he became, on the death of Ørsted, Director of the Polytechnic Institution and Secretary of the Royal Academy of Sciences.

The enumeration of all the original publications of Förchhammer, the greater number of them pertaining to chemistry, mineralogy, and geology, is not consistent with the nature of this Address; but in order to do full justice to the memory of my valued friend, I have handed over to the President of the Royal and Geological Societies an admirable notice of his deeds and accomplishments, prepared at my request by his distinguished countryman, Admiral Irmingier, of whose fellowship we are all so proud. Suffice it to say, on this occasion, that Förchhammer's analyses of many simple minerals, as well as of magnetic iron, his treatise on the elements of sea-water, and their distribution in the ocean, the result of 180 analyses, are works of a very high scientific order. The last of these was undertaken to establish the view he embraced, that "sea-

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\* As one of his German biographers implied that Dr. Barth was not adequately honoured in this country, let me remind his countrymen that he received at the hands of the British Government an honour of the Crown which was not obtained for Speke and Grant, although the utmost exertions were made by myself as President of the Royal Geographical Society, as well as by many influential persons, to procure for them also that distinction.

water is the result of the reciprocal agency between the washing out of different substances from the earth, and their chemical, physical and organic agencies."

Forchhammer first visited England in 1820, and examined our sedimentary formations, then very imperfectly classified, particularly as regarded all the older rocks. In subsequent years he wrote memoirs on the geological structure of his own country, and, what is well worthy of notice, he explained the outlines of the lands of Denmark, by showing to what extent they were due to geological structure and ancient movements, and how far they had been modified since the earliest traceable historical period. His memoir on the influence of sea-plants in the production of alum shale was a first step in a series of publications in which he demonstrated how in the present time, as in former periods, different substances after certain changes revert to their original form and condition. Indeed, several of his other works have the same bearing, viz., "On the minerals in animals and plants of the ocean;" "On the spread of mineral matter through the strata of the earth's crust;" "On the origin of Dolomite;" "On the artificial production of crystals of apatite and magnetic iron." &c. Besides these purely scientific works, he was of great use to his country by showing the relative value of peat and other combustibles, and by establishing good supplies of water by means of Artesian wells.

Making several journeys to England, he travelled in one of them (1847) with Professor Phillips, the present President of the British Association, and as I then made his acquaintance, it afterwards became a source of great gratification, as well as instruction to myself, to cultivate his society whenever I passed through Copenhagen in my visits to Russia between 1841 and 1845 inclusive. It was in his native capital that Forchhammer shone out conspicuously, not only through the high station he had there attained as a man of science, but also by his powerful social influence. Indeed, from the King downwards he was esteemed—nay beloved by every one, and he invariably used his influence to the best possible effect.

Being associated with him in 1844 as member of a great scientific Scandinavian meeting at Christiana, it was my good fortune to make geological excursions with him in Norway; and on these occasions I was forcibly struck with his ability and quickness in accounting for the metamorphism of several members of the Silurian deposits in those tracts where they are in contact with the igneous rocks, which

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have changed fossiliferous limestones into white saccharoid marble, sandstone into quartz rock, and shale into crystalline slate. In 1845 he was very servicable to me in explaining the exact relations of several of the Silurian rocks of the south of Sweden (Scania, &c.), which I had just visited. Among many other original views, he called my attention to the proofs in the physical configuration of the coasts of a long line of former subsidence, which passing from Denmark in the north, deepened in its range southwards, if it did not actually form the Straits of Dover. He contended that in all the submarine forests along these shores, the trees which still stood erect, with their roots in their native soil, had nearly all been truncated about two or three feet above their stools—a result, as he justly said, which could not have happened if a gradual subsidence of an inch or two in a century had taken place, as in such case the wood must have certainly rotted and disappeared.

In alluding to my intimate relations with Forchhammer, I must pointedly advert to the cordial and encouraging support which he gave me, in company with his eminent countryman Oersted, when I presided over the British Association at Southampton, in 1846; neither can I forget how he gratified me by his presence when I lectured in 1849, during the meeting of the British Association at Birmingham, to a vast multitude in the caverns of Dudley.

In summing up his character I must say that I never met with a man who was more truly good and loveable. His bodily powers, as exhibited during a pedestrian excursion, were extraordinary; and he ever enlivened the way with so many illustrations or merry anecdotes that no symptom of fatigue could arise in his company. As a lecturer, he was lucid and persuasive, and ever carried his audience with him.

Honoured by his sovereign, beloved by his countrymen, and occupying the highest position to which a man of science can attain, the body of this eminent and loyal Dane was followed to the grave by persons of every class, all of whom felt that among them no one had been more broken-hearted at the spoliation of Denmark, and the invasion of his native Jutland, than the high-minded and patriotic John George Forchhammer.

NILS NORDENSKIÖLD.—This skilful mineralogist and geologist and close observer of the outlines of the earth, who, on my own motion, was not long ago added to the list of our Honorary Corresponding Members, died on the 21st of February last, near

Helsingfors, in Finland; being then in his seventy-third year. It was especially for his new map of Finland, illustrating his able memoir on the scratched and polished surfaces of the rocks of his native country, that we considered him to be well worthy of the honour we conferred on him. No work, in my opinion, has more thoroughly demonstrated the truth of the conclusion at which I had arrived, and on which I dwelt at some length in my Address of 1864, namely, that during the glacial period great marine currents, transporting masses of drift as well as gigantic icebergs over sea-bottoms which have since been raised into lands, have produced striations, flutings, roundings, and polishings, precisely similar to those which result from the advance and passage of terrestrial glaciers. Finland unquestionably was never passed over by a terrestrial glacier any more than was the northern portion of the United States of America; and for his clear demonstration of the fact as regarded his native land, the name of Nils Nordenskiöld will ever be remembered. Professor Nordenskiöld, who made several visits to this country, and attended two meetings of the British Association, was much liked for his unassuming and agreeable manners. His son, Professor Adolf Nordenskiöld, of Stockholm, is well entitled to take the place of his honoured parent for his recent researches in Spitzbergen, and particularly for his excellent map of that country.

Baron Charles Claus von der DECKEN.—The melancholy fate of this high-spirited Hanoverian nobleman, in his endeavour to reach the interior of Africa by ascending the River Juba in a steamer, has been recently brought before you; and no one has more truly deplored this catastrophe than myself, who only two years ago had to offer to him in your name the highest honour which we have to bestow.

Baron C. C. von der Decken was born in 1833, at Kotzen, in Brandenburg, of a family of high rank. His father, Ernest von der Decken, fought, as one of the brave German Legion in the British service at the battle of Waterloo, and afterwards filled several stations of importance at the Court of Hanover during the reigns of George IV., William IV., and Ernest, King of Hanover. In 1816 he married Adelheid von Stechow (who, after his death, married Prince Pless), and by whom he had three children, our traveller being the youngest.

As a youth, Charles von der Decken evinced a strong desire to visit distant lands, whilst the study of history, geography, and mechanics, as well as the construction of maps, gave him much pleasure.

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Having entered the Cadet corps at the age of sixteen, he was patronised by the King, and in 1850 entered the Hanoverian army as a lieutenant in the Queen's Hussars. He availed himself of his leave of absence to travel through Europe, and in 1858 he made his first endeavour to penetrate into Africa, but was prevented from advancing across the desert by an attack of fever, which compelled him to return.

In 1860 he quitted the army, and soon after embarked at Hamburg for Zanzibar, it being his intention to join his countryman Dr. Roscher in an endeavour to reach the great Nyassa Lake. The murder of Roscher compelled von der Decken to choose another line of research, and he went in an Arab dhow, accompanied only by his servant Corelli, to Kiloa; but failing to induce carriers to accompany him, he returned to Zanzibar. A second effort was also unsuccessful; for although he then contrived to secure a sufficient escort, his men deserted, and his soldiers mutinied; so that, after penetrating a certain distance, his efforts during three months of much privation were unavailing, though, as shown by his works just published in Germany, he acquired some useful knowledge of the country. Being once more at Zanzibar, in 1861, he projected an expedition to examine the great mountain of Kilimandjaro, to ascertain if the report of the missionaries Knapft and Rebmann was true, who stated that its summit was covered with snow; he induced our countryman, the zealous young geologist, Richard Thornton, who had left Livingstone, to accompany him. The result was, that Thornton constructed a large contoured map of the mountain, determined its mineral characters, and, in conjunction with the Baron, made a vast number of physical observations on altitude, temperature, latitude and longitude, some of which have been published in the last volume of our Journal (vol. xxxv. p. 15). In October, 1862, Charles von der Decken made another and a still more successful effort to complete the examination of the same great mountain, which he then ascended to the height of 14,000 ft., or 6000 ft. higher than on the previous occasion, being accompanied by the astronomer and physicist Dr. Karsten. By this survey the altitude of Kilimandjaro was fixed at upwards of 20,000 feet, and it was clearly proved to be a snow-capped mountain.

Returning to Europe in 1863, having visited the Isle of France by the way, it was in consideration of his distinguished services that we awarded to him our Founder's Gold Medal, whilst the King of Hanover conferred upon him the Guelphic Order.

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Thus encouraged, he next resolved to employ his means in fitting out such an expedition as would enable him to ascend far into the interior of Africa, by one of the deepest of the rivers which flow through the Somaui country to the north of Zanzibar and Mombas.

Having been privy to the strenuous efforts he made to construct a large and a small steamer suited to river navigation, it gave me the truest pleasure to afford this distinguished man every possible aid. Thus the vessels constructed at Hamburgh had to be transported in pieces on board a ship to be chartered for Zanzibar; and as at that time the Danish war was rife, it was necessary to obtain a free passport from the Danish Government for the purpose of this scientific expedition. Then, again, it was essential to raise the position of von der Decken in the estimation of the Sultan of Zanzibar, who had an immense respect for the English, but none whatever for a German traveller. Good credentials were therefore obtained from the Foreign Office, and the Duke of Somerset most considerately gave orders that the British naval force at Zanzibar should not only aid him in putting his steamers together, but should assist in getting them over the bar of any river he might wish to ascend.

Having organised a strong and well-selected party of Germans, including Lieutenant von Schiekh of the Austrian navy, Dr. Link, and others, he sent the vessel round by sea, going himself by way of Egypt, chiefly in the hope of inducing the Pasha to allow him to take with him some negro soldiers out of the Egyptian army; but in this he met with disappointment.

Arrived at Zanzibar, and having put his vessels together, he first made a fruitless attempt to enter the River Ozi or Dana, and finally entered the Juba in his larger steamer, the smaller vessel and one of his companions having been lost on the bar of that river. He had, as you know, ascended that stream for about 380 miles, when the fatalities occurred by which the loss of the ship was followed, as we are informed on the testimony of his native followers who escaped, by the murder of this devoted explorer and his companion Dr. Link.

I forbear to enter now upon further details of his life; for full justice can only be done to the memory of my lamented friend in an extended memoir. I now simply conclude by reminding you of the gallant perseverance with which, undaunted by frequent attacks of fever, and the hostility of the natives, he overcame

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obstacles, and by two expeditions elicited, for the first time, the true physical and natural history characters of the lofty snowy equatorial mountain of Kilimandjaro; and, lastly, how at great cost he organised such an expedition as no other individual has ever conducted, at his own cost, to Africa. If we consider how chivalrously he resolved to penetrate into the interior by the most difficult of all the lines of research, and one never attempted by any former traveller, magnanimously resolving to "do or die," we must all admire such noble conduct. His affectionate mother, the Princess Pless, and his only brother, plunged as they have been into the deepest distress, would still cling to any shred of hope that he may still be alive, and a captive; but, alas! all persons at Zanzibar who are the best qualified to form a just opinion have no doubt that this high-minded and courageous traveller, as well as his associate Link, are no more. All honour to their memory!

Jacob SWART was for several years our Corresponding Member for Holland, a country whose geographical enterprise and literature place it in a very high rank among the nations of Europe. He was born at Amsterdam, July 17th, 1796, and educated chiefly at Dordrecht and the Hague. At twenty years of age he entered the Dutch Royal Navy, passing a few years in their East India possessions. Returning to Holland, and finding a sea-life distasteful, he resigned his commission, and applied himself vigorously to his favourite study of mathematics, and afterwards became a professor in the Royal Naval School in Amsterdam. Soon after this he associated himself with the ancient house of G. Hulst van Keulen, whose nautical publications, for more than two centuries, have been well known throughout the world, and which, during the early part of its existence, supplied all Europe with charts. Early in life he composed a valuable collection of astronomical and nautical tables, still in great estimation; and these, with several other works of a similar nature, established his claim to acknowledged usefulness. This was recognised by his being appointed to various positions in the administration of naval matters, and to honorary association with many of the excellent Societies which characterise the Netherlands. As a further mark of appreciation of his good services, the King, in 1847, invested him with the Order of the Eiken Kroon. In 1841 he started his excellent nautical review, the '*Verhandelingen en Berigten betreffende het Zeewezen*,' &c., which, continued to the present day, contains a vast mass of valuable geographical information, and that especially relating to the East

India possessions of the Netherlands. About this time also he drew up an extensive and fine series of charts of the Indian Sea, which embraced the entire amount of our knowledge of its hydrography. Among others of his very numerous works he drew up a Memoir, accompanying an unpublished journal and map, of the celebrated southern voyage of his famous countryman Tasman, a work of great interest. Employed incessantly and laboriously with many literary and public duties, his health failed in 1863, and he died in his native city, much esteemed, on March 14th in the present year. Our library and Journal have been enriched by several valuable contributions by him.

CAPITAINE DUPLERREY.—Louis Isidore Duperrey, member of the Institute of France, and one of our Honorary Corresponding Members, was born at Paris the 21st of October, 1786. He entered the French navy at the age of sixteen, and in 1811 contributed to the Hydrographical Survey of the coasts of Tuscany. In 1817 he embarked as midshipman in the *Uranie*, and accompanied Captain Freycinet in a scientific voyage round the world. He became Lieutenant in 1822, and in that year set sail from Toulon as Commander of the *Coquille*, in which vessel he made one of those scientific voyages which redound so much to the honour of a nation, returning to Marseilles on March 24th, 1825. The theatre of his explorations was South America and Oceania, and he made during his voyage a large number of observations on the pendulum, which served to demonstrate the equality of the flattening of the two hemispheres and contributed to the determination of the magnetic equator. Geography owes to him also maps of the Caroline Islands and Dangerous Archipelago. He was also the author of several memoirs published in the '*Annales de Physique et de Chimie*,' and in the '*Annales Maritimes*,' &c. &c. The great merit of his labours, particularly those on terrestrial magnetism, gained him admission into the *Académie des Sciences* in 1842. He died in the month of August last.

ADMIRAL DON EDUARDO CARRASCO.—This distinguished Peruvian was born in Lima on the 13th of October, 1779, the son of Don José Carrasco, a Spanish noble and rich merchant of Lima. In 1794 he entered the Royal Naval Academy of Peru to study for the naval profession, and in 1800 embarked as assistant "Piloto" on board the frigate *Fuente Hermosa*, being engaged in subsequent years, when not cruising in the Pacific, as one of the naval teachers in Lima. In after years he became impressed with the liberal views then so prevalent, and was one of the first to excite in his native land that



spirit of resistance to Spanish authority which led to the War of Independence. Dismissed from the service in consequence of these opinions in 1818, he devoted himself to the study of medicine, and on the declaration of Independence in 1821 was made by General San Martin Secretary-General of the new Republic. The late Admiral Fitzroy, who visited Peru in the *Beagle* in 1835, testified in his narrative to the information and assistance he obtained from Captain Carrasco, who was then Director of the Naval Academy of Lima. In 1839 Carrasco succeeded his friend Paredes as *Cosmographo Mayor* of Peru, and in 1855 became Rear-Admiral. During these years he completed a map of the confederated republics, by order of General Santa Cruz, and this was then the best map known of these countries. The '*Calendario y Guia de Forasteros*,' which he first published in 1826, was replete with geographical, historical, and statistical information with regard to Peru. Admiral Carrasco was elected honorary member of our Society in 1839, on the recommendation of Admiral Fitzroy. He died on the 16th November last.

Professor KUPFFER.—This distinguished member of the Imperial Academy of Sciences of St. Petersburg was one of our Honorary Foreign Associates, and during many years exerted himself with great pertinacity and perseverance in establishing magnetical observations in various parts of the Russian empire. To the value of these labours General Sabine, the President of the Royal Society, has borne testimony.

Besides his travels to the Caucasus and the Ural, and his descriptions of the structure of those mountains, Professor Kupffer rendered practical service to his country by the publication of his great work '*Poids et Mesures Russes*,' in two volumes imperial quarto, in which every Russian weight and measure has had its equivalent assigned in nearly all the other countries of the world.

Professor Kupffer was much attached to England and often visited our country, and the meetings of the British Association for the advancement of Science were twice attended by him. Among his other numerous works are the following, copies of which are in our Library:—*Recherches Experimentales sur l'Elasticité des Metaux*; '*Note relative à la Temperature du Sol et de l'Air aux limites de la Culture des Céréales*;' '*Annales de l'Observatoire Central de Russie*,' and '*Annuaire Magnetique et Météorologique*,' both of which serials he brought out for many years, besides the '*Compte-Rendu Annuel*' and volumes of Tables of Meteorological and Magnetic Observations.

**The Earl of DONOUGHMORE.**—The Society has lost a staunch friend in Lord Donoughmore, who among his varied accomplishments had a true love for geography. Clear-headed and anxious to be useful, he was, when not suffering from severe attacks of gout, to which he was subject, of great service in our Council. Every well-wisher to the Royal Geographical Society, and myself in particular, felt much indebted to this high-minded nobleman two years ago, when by his lucid explanation and fervent appeal to a General Meeting, he calmed an irritable feeling existing among a very few of our Fellows, which, if it had spread, would have been highly prejudicial to our well-being. His lordship's capacity for business, his clear elocution, and the weight of his opinions, enabled him to be of great service in his place in Parliament, and his death at the early age of 42 must be considered a national misfortune.

**LORD MONTEAGLE.**—This accomplished nobleman occupied many prominent public situations, including the Chancellorship of the Exchequer. In early days he distinguished himself in the University of Cambridge, and was through life earnest in supporting every intellectual advance, whether in the fine arts or in science. His name is bound up with many public events of this century which the historian will have to record, but which are foreign to the purpose of this short notice. I have only to add that Lord Monteagle was much beloved and respected by a large circle of friends, including myself, who enjoyed his cheerful, instructive, and agreeable society.

**Dr. John LEE.**—The late Dr. Lee, so widely known in various circles, was distinguished as an astronomer, and his biography will be most fittingly enlarged upon by the President of the Astronomical Society, of which he was so liberal a patron and formerly President. His name will be probably best remembered in after years by the finely illustrated volume '*Ædes Hartwellianæ*,' which was written by his friend, our late associate, Admiral Smyth, and described the manor and mansion of Hartwell, the seat of Dr. Lee, together with the observatory, which, as I have already mentioned in this obituary notice, was originally the property of the Admiral. In this mansion Dr. Lee dispensed the most ready and hearty hospitality to all his friends, and especially to men of science. He was a man of wide and generous sympathies. For many years I have observed him to be a constant attendant at the meetings of the British Association, where his absence will be much felt. He died in February last, at the ripe age of eighty-one years.

Dr. Thomas HODGKIN.—The late Dr. Thomas Hodgkin, a member of the Society of Friends, who was so widely known as an active philanthropist, belonged for a period of fifteen years to the governing body of our Society, first as Honorary and afterwards as Foreign Secretary, and Member of Council. He was born in Pentonville in 1798, and having adopted the profession of medicine, filled in early life the posts of Demonstrator of Morbid Anatomy and Official Curator of the Pathological Museum at Guy's Hospital. During these years he published various treatises on medical subjects, and distinguished himself as an earnest advocate of projects of medical reform. He was subsequently nominated Member of the Senate of the University of London, on the establishment of that institution in 1836—a post which he continued to occupy till his death. On the death of his friend Dr. Prichard, the eminent author of the 'Physical History of Man,' Dr. Hodgkin read a most interesting memoir of his life before the Ethnological Society (1849). Although he had not achieved a reputation as a geographer or traveller, Dr. Hodgkin made good use of his general scientific attainments and powers of observation during the various journeys to distant countries which he made, in pursuit of the noble philanthropic objects that occupied so large a portion of his attention. It was thus that, after his return from the mission to Morocco, which he undertook in company with Sir Moses Montefiore, for the purpose of obtaining from the Sultan concessions in favour of the Jewish population, he communicated a paper to this Society, containing his observations on the physical geography of the region. He also made two journeys to the Holy Land on philanthropic errands; and it was whilst on the second of these that he was seized with the illness which terminated his useful life at Jaffa on the 5th of April last.

GEORGE RENNIE.—Among the eminent practical Civil Engineers of our day, my valued friend the late George Rennie stood pre-eminent. The eldest son of John Rennie, whose great engineering works are known in many a country, our deceased member, after an early education in London and its environs, was sent to the land of his fathers; and at Edinburgh, under Professors Playfair, Leslie, Hope, Christisson, and Dunbar, he acquired those sound elements of knowledge which were ever afterwards conspicuous in all his works. After some years of service in the Mint, he went into partnership with his younger brother, the present Sir John Rennie; and thenceforward his career was marked by a continuous

series of important mechanical operations at home and abroad, whether in our dockyards or for the governments of Portugal, Mexico, Peru, Turkey, and Russia. Together with his brother and Mr. C. Vignoles, he laid out the line of the Liverpool and Manchester Railway, as designed by George Stephenson, and, what is remarkable in engineering affairs, the cost of completing this famous work as carried over the Chat Moss was less than the estimate by fifty-seven thousand pounds! If the railway gauge proposed on that occasion by the brothers Rennie had been adopted (*viz.* 5 feet 6 inches) the country would never have been agitated by the controversy of the broad and narrow gauges; for that width, which is in force in Ireland and elsewhere, is now admitted by all parties to be the best.

It is not for me to enumerate the many other important works of our deceased member. I may, however, say that the brothers Rennie, though not the original inventors, were the first to introduce screw-propellers into the British navy, in 1840, thus producing a great revolution in seamanship and maritime tactics; it being a curious fact that John Rennie, the father, first introduced paddle-steamers into the navy in 1819.

Much of the spare time of Mr. George Rennie was devoted to purely scientific pursuits. As early as 1822, he became a Fellow of the Royal Society, and, in virtue of his sound contributions as published in the 'Philosophical Transactions,' he attained the honour of being the treasurer or second officer of the parent Scientific Society. His Reports, published in the volumes of the British Association for the Advancement of Science, are also standard evidences of his knowledge, and will assuredly secure for him a forward place among the men of science of our age. With these mental qualifications Mr. George Rennie united in his own character the most engaging kindness of manner, so that I can safely affirm that amidst my scientific friends I knew no one who was more generally beloved and respected than himself. He died on Good Friday last, after a long illness brought on some years ago by having been accidentally run over by a carriage.

Dr. William Freeman DANIELL distinguished himself by the ardour with which he pursued various branches of science during a long residence as medical officer on the West Coast of Africa. In 1849 he published a valuable work, embodying some of the results of his experience, under the title of 'Sketches of the Medical Topography and Native Diseases of the Gulf of Guinea.' He also wrote a work

on the copals of Western Africa, and became very favourably known amongst botanists by the success with which he cultivated the economical and medicinal branches of the science, in the countries where he was stationed. On his return from his seventeen years' residence in the pestilential climate of Western Africa, he was, to the surprise of us all, in the enjoyment of robust health; but on his removal to Jamaica, after he had served in the expedition to China in 1860, his constitution gave way, and he returned to England in 1864 completely shattered in health. He died on the 26th of June last, at the early age of forty-seven. Dr. Daniell was member of the College of Surgeons and Fellow of the Linnean Society. His kind disposition, disinterestedness, and fidelity to his friends, endeared him to all who had the advantage of his acquaintance.

Commodore CRACROFT, C.B., died in Jamaica on August 2nd of this year, aged 49. The second son of Colonel Cracroft, of Hackthorne, Lincolnshire, he entered the Royal Navy in the year 1828, was promoted to rank of lieutenant in 1841, and served as flag-lieutenant to Admiral Hyde Parker at Portsmouth. Obtaining the rank of commander in 1846, he proceeded to China in command of the *Reynard*, and while actively engaged in operating against the pirates, he added considerably to our hydrographical knowledge of those seas, but was unfortunate enough to lose his vessel on the Pratas shoal. During the Russian war he served with Sir H. Keppel in the *St. Jean d'Acre*; and subsequently, in command of the *Goryon*, he took part in the reduction of Bomarsund. In 1854 he was appointed captain of the *Niger*, and proceeding in that vessel he took a prominent part in quelling the first Maori insurrection in New Zealand, and was the means of rescuing a party of volunteers and many colonists from destruction by the natives. For these services he was nominated a Companion of the Bath, and in 1863 he succeeded Commodore Dunlop in the command at Jamaica, where he unfortunately fell a victim to fever after a few days' illness.

In addition to the persons whose names have been already mentioned, the Society has to regret the loss of the following Fellows:—Mr. M. W. Atwood, Mr. R. S. Black, Mr. George Bower, Mr. J. G. Cole, Mr. G. Wingrove Cooke, Viscount Cranbourne, Mr. R. H. Davies, Colonel the Honourable A. Egerton, Mr. F. Goldsmid, Mr. Christian Hellmann, Mr. W. H. T. E. Huskisson, Captain H. J. Hartstene, the Rev. C. C. Hill, Mr. G. F. Heneage, Mr. F. N. Isaac, Mr. Pliny Miles, Mr. E. Markham, Captain P. Maughan, Rev. C. Oakley, Mr. Benjamin Oliveira, Mr. Henry Reeves, Mr. J. A.

Olding, Colonel C. Sim, Major W. H. Sitwell, Mr. Robert Sweeting, Mr. A. Spottiswoode, Mr. H. F. Southey, Mr. Franklin Travers, Mr. F. Verbeke, General Sir E. C. Whinyates, K.C.B., and Mr. Robert White.

Several of these noblemen and gentlemen were distinguished for their acquirements, though no one of them, as far as I know, has contributed directly to the advance of Geographical science. One of them, however, the late Mr. Benjamin Oliveira, formerly a member of Parliament, deserves grateful notice on our part, inasmuch as he has bequeathed a sum of money, the exact amount of which is not yet ascertained, to increase the funds of the Royal Geographical Society.

ADMIRALTY SURVEYS.—The following resumé, as drawn up by the Hydrographer,\* will show the progress which has been made in the various surveys carried on under the direction of the Admiralty during the year which has just passed.

Although from various causes, which could not have been foreseen or guarded against, the Hydrographical Survey has in some parts of the world fallen short of the average amount of work performed during preceding years, yet in other cases it has been very much exceeded; and on the whole we may fairly consider that the efforts of those engaged in these onerous and often trying duties have been as successful as could have been desired or expected.

The modified system in regard to the home surveys alluded to in the report of the year 1865 is now in full operation, and the introduction of a new element into our foreign surveys, by appropriating a small ship of war on the principal naval stations to auxiliary or occasional surveying duties, has been carried out in China and North America with a fair prospect of success.

Not the least gratifying feature of this report is the increased interest which has been taken in geographical and hydrographical subjects by naval officers generally, as evinced by numerous, and in many cases important, remarks as well as plans received from them, and which may perhaps in some measure be fairly attributed to the liberal supply of charts which is now dispensed by the Admiralty to officers of all grades in her Majesty's ships.

*Coasts of the United Kingdom.*—Captain E. J. Bedford, with his three

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\* Captain Richards, R.N.

assistants in the *Lightning*, have been employed in completing the soundings off the western coast of Scotland and the Hebrides, and have made a careful re-examination of the Sound of Mull, with additions and corrections to various parts of the coast.

This vessel is for the present removed to the south-western coast of England, and has commenced a re-survey of Cardiff Roads and the neighbourhood, rendered necessary both in consequence of the changes which have taken place in many of the banks since the last survey by Captain Beechey in 1849, and of the vastly increasing commerce in the ports of the Bristol Channel.

Staff-Commander E. K. Calver and his party of three have completed a thoroughly new and excellent survey of the Downs, and have also entirely resurveyed Yarmouth and Lowestoft Roads, including the coast between Winterton and Southwold. Both of these works were much required, owing to the very considerable shifting of the banks which had taken place, especially on the shores of Suffolk.

Commander Brooker has been employed with a steam launch in the neighbourhood of Spithead and the Bar of Portsmouth Harbour, where the constant attention of a surveying officer is required to watch and record the changes which are taking place, owing to natural and artificial causes; he has re-surveyed part of the Medina River at Cowes, where marked improvements have been made by dredging and buoying.

The Channel Islands survey, under Staff-Commander John Richards and Mr. W. B. Calver, Master, has progressed very favourably, and the eastern and western coasts of Jersey, with numerous soundings, have been added to the southern shores of that island, which part was surveyed last year. New Sailing Directions for Jersey have also been prepared by the former officer, and published by the Admiralty.

*Foreign Surveys.*—The Mediterranean surveys under Captain Mansell in the *Hydra*, and Commander Wilkinson in the *Firefly*, with their respective assistants, have made very good progress during the past season. Captain Mansell has minutely surveyed the western coast of the Morea from the Gulf of Patras to the eastern shore of the Gulf of Kalamata, together with several plans of anchorages. The whole of the Morea may now be said to be very fairly charted, although it will be desirable, when more important work is completed, that some additional soundings should be obtained and a re-examination of the shore made between the Gulf of Kalamata and Cape Matapan. Captain Mansell has retired from his long

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and useful labours, after a period of thirty-two years passed in the surveying branch of his profession, and has been succeeded by Captain Shortland in the command of the *Hydra*.

Commander Wilkinson during the past season has completed the coast of Tunis from Cape Bon to the southern part of the Bay of Kabes, with its off-lying islands and shoals, also the Gulf of Tunis, with plans of the anchorage off the Goletta, and the Bay of Hammamat; he has likewise completed the western coast of Sicily from the Gulf of Castel-a-mare on the north to Cape St. Marco on the south; disproved by numerous soundings the existence of the Fox Rock off the south coast of Sardinia, which had so long been a source of anxiety to navigators; made plans of the anchorages on the south coast of that island, and added considerably to the soundings in the Malta Channel. The *Firefly* has now been withdrawn from the Mediterranean survey, which will henceforth be carried on by the *Hydra* alone.

*China and Japan*.—The *Swallow* and *Dove*, under Mr. Edward Wilds and Mr. George Stanley, Masters, have been very profitably employed in Northern China; having completed the examination of the Shantung Peninsula and surveyed a considerable portion of the western coast of the Island of Formosa, sounded the channels between that island and the main, and added very materially to the soundings generally in the northern portion of the China Sea between Hong Kong and the Corea. The *Swallow*, having completed her time, is on her passage to England.

The *Rifleman*, under Commander Ward, has added something to our knowledge of the reefs in the main route to China, and has resurveyed Victoria Harbour in the Island of Labuan.

The *Serpent*, Commander Bullock, performing in addition to the duties of a ship of war, those of an auxiliary surveying-vessel, and attached to the squadron of Vice-Admiral King in China, has already contributed much useful information; consisting of soundings and observations on the currents on L'Agulhas Bank, the rectification of the positions of doubtful dangers at the western entrance of the Java Sea, a correction of the survey of St. Paul's Island in the Indian Ocean, a plan of the entrance of Bruni River in Borneo, as well as various soundings in the Palawan Passage and China Sea.

*Colonial Surveys*.—*Nova Scotia*. The survey of the coasts of this colony has been brought to a close by Commander P. A. Scott, who was materially aided during the past season by Captain Hamilton



of the *Sphinx*, in obtaining the soundings at the entrance of the Bay of Fundy and off the south-east coast; a service requiring much judgment, and not unattended with risk, on a coast almost continually enveloped in fogs and subject to strong and uncertain currents. Additional soundings are still required in the Bay of Fundy, which will be obtained, during the short intervals of favourable weather which present themselves in September and October, by one of the squadron under Sir James Hope.

*Newfoundland*.—This important survey is progressing favourably under Mr. J. H. Kerr, Master R.N. During the past year he has surveyed Random and Smith Sounds and other portions of the west side of Trinity Bay; thus completing the whole of that bay to Cape Bona Vista.

*West Indies*.—Mr. Parsons, Master R.N., who is conducting this survey in a small hired vessel, has completed during 1865 the survey of the island of Tobago; and Commander Chimino, in H.M.S. *Gannet*, has commenced and almost completed the whole of the Gulf of Paria, with a considerable portion of the coast of Trinidad; in both of which great discrepancies were found to exist in the present charts.

*British Columbia*.—Mr. Pender, Master R.N., in charge of the survey in this colony, has, with his two assistants, surveyed the extensive estuary known as Knight's Inlet, with the many channels and passages leading into it from Queen Charlotte Sound, Broughton and Johnstone Straits. The islands are so numerous and the coasts so much broken that although it is not more than 70 miles from the entrance to the head of the inlet, yet its shores comprise an extent of coast-line amounting to upwards of 700 miles.

The entrance of Smith Sound to the north-westward, and immediately to the northward of the north point of Vancouver Island, has also been examined, and an excellent and convenient harbour discovered; thus the whole of the mainland of British Columbia, from its southern boundary in the parallel of  $49^{\circ}$  N. to the entrance of Fitzhugh Sound in  $51^{\circ} 20'$ , is now accurately laid down on our charts; probably the most intricate and broken stretch of coast in the world. The survey is progressing northward to our northern boundary in  $54^{\circ} 30'$  N., and the recent discovery of good coal in Queen Charlotte Island has rendered it necessary that a portion of the shores of that island should at once be examined.

*South Africa*.—Mr. W. Stanton, Master R.N., who succeeded to

the charge of this survey in March, 1865, has already made rapid progress with the examination and charting of the coast, having completed from Cape Infanta to Izervack Point, a distance of 60 miles, and from Cape St. Francis to Recife Point, a further distance of 68 miles. Owing to the exposed character of this coast the difficulties of obtaining the soundings are very great; but during the past season Mr. Daniel May, Master R.N., the chief-assistant, and for some time in temporary charge, was enabled to sound a considerable portion of the coast, through the assistance rendered him by Commander C. Jago of H.M.S. *Rapier*.

*New South Wales*.—Commander Sidney and his two assistants have been very successful during the past season, and have completed the coast of New South Wales, from the Solitary Islands to Point Danger, the northern boundary of the colony; and where the work has been satisfactorily connected with the Queensland Survey brought southward from Moreton Bay. They have also commenced a resurvey of Port Stephens, and have surveyed the coast from it northward to Sugar Loaf Point. The remaining portion of the seaboard of the colony, from Sydney southward to Cape Howe, now requires to be rectified, to place it on the same footing of accuracy with that already accomplished to the north; and arrangements are made to carry out this desirable object.

*Queensland*.—Staff-Commander Jeffery and his assistant Mr. Stanley, Master R.N., have completed the survey of the northern entrance to Great Sandy Strait; have connected the southern boundary of the colony with Commander Sidney's work at Point Danger; and are now employed in examining the coast between that point and the northern extremity of Moreton Island.

In the examination of this portion of Queensland, much assistance has been rendered by Commander Nares in the *Salamander*; this vessel is specially employed on the coast of Queensland in connexion with the semi-Imperial establishment at Cape York, and her commander loses no opportunity of adding to our hydrographical knowledge of that magnificent channel, known as the Inner Passage, leading from Australia to our Indian possessions; and along the shores of which (owing in a great measure to the energy and perseverance of that intelligent and enlightened geographer Sir George Bowen, the Governor of the Colony) colonization is spreading so rapidly as already to have reached the head of the Gulf of Carpentaria.

There is every reason to believe that at no distant day there will be regular steam-communication to India and England through this Inner Passage.

The *Salamander* is at the present time engaged in making an examination of the eastern and southern shores of the Great Gulf of Carpentaria.

*Victoria*.—In this colony Commander Cox, with his staff, has completed, on a very elaborate scale, the harbour of Western Port, and has surveyed the intervening coast between it and Port Phillip.

*South Australia*.—The survey of the coast of this colony, at present under the temporary charge of Mr. Frederic Howard, Master R.N., was transferred more than two years since, at the request of the local Government, to the north-western portion of the territory, in connection with the establishment of a new settlement in the neighbourhood of the Adelaide River. It was hoped that ere this Mr. Howard and his party would have returned, and resumed the much-to-be-desired examination of the southern coast; but, owing to the ill success which has hitherto attended the efforts to establish this new settlement, the little surveying-vessel *Beatrice* has been chiefly employed in reconnoitring the neighbouring coasts of Port Darwin and the Victoria River; and, indeed, in attending upon and carrying provisions and stores for the colonists. Thus, although the surveying officers and their crew have worked with the greatest energy and zeal, and have suffered very many privations, we have little to show for their labours during the last two years in the way of charts or hydrographical information of value to the navigator. What could be done, however, has been done. Adam Bay, the site of the settlement, has been surveyed; casual reconnaissances have been made of Melville Strait, Van Diemen's Gulf, and the western shores of the Gulf of Carpentaria, together with soundings wherever they could be obtained.

It is much to be desired, and it is expected, that the *Beatrice* will very shortly resume the more important work originally assigned to her on the southern coasts of Australia.

To sum up the actual results of the labours of the Hydrographic Department, on shore and afloat, it may be stated that sixty-three new charts, including portions of almost every part of the globe, have been published during the year 1865. Among them a chart of the southern hemisphere on the Polar Projection, illustrative of the ice-drift during the different seasons; and showing to what

extent the great circle or composite routes between the Cape of Good Hope, Australia, and Cape Horn, may be ventured on with safety. This chart has been carefully compiled from the observations of all the Antarctic navigators since the time of Cook; and, from the valuable papers on icebergs in the Southern Ocean by Mr. Towson, as well as documents from the Meteorological Department of the Board of Trade, additions and corrections have likewise been made to 1200 original plates. The number of charts printed has been 169,000. A new book of Sailing Directions has been published for the west coast of Hindostan, and new editions have been brought out of the West India Pilot, Part 2; South American Pilot, Part 2; East Coast of Africa; and the Island of Jersey; together with the annual tide-tables, lighthouse books, pamphlets, hydrographical notices, &c.

It is gratifying to add to this brief sketch of the labours of our Naval Surveyors, that many useful contributions have been received during the past year from officers engaged in the regular branch of the naval service; and especially from the squadron under Admiral Sir James Hope, G.C.B., in North America and the West Indies; and it is due to Captain Hamilton of the *Sphinx*, Mr. Dathan, Master of the Admiral's flag-ship, Mr. Cavanaugh, Master of the *Cordelia*, and Mr. Dixon, of the *Rosario*, to remark that they stand prominently forward among the many who have shown an interest in geographical research. Commander St. John of the *Opossum*, while engaged in seeking out the haunts of the Chinese pirates, has never omitted an opportunity of turning his talent for hydrography to good account; and we are indebted to him for the greater part of the knowledge we possess of the shores of the great Island of Hainan, in the Gulf of Tongking, as well as many others of the less frequented parts of the coast of China.

To Mr. Tilley, Master R.N., in command of Bishop Patterson's missionary yacht the *Southern Cross*, we are also much indebted for valuable remarks, as well as plans of many of the islands in the little-visited portion of the South-West Pacific.

It will have been noticed that the *Firefly*, Commander Wilkinson, has been withdrawn from the Mediterranean, and that the *Swallow*, Mr. Wilds, is on her way to England from China; it is by no means, however, in contemplation to reduce during the ensuing year the force engaged in surveying operations. In China, the Corea, Japan, and among the islands of the Eastern Archipelago, there exists, and will exist for a long time to come, a wide field for geo-

graphical and hydrographical research; and it is proposed to replace the *Swallow* by another vessel specially prepared for this service.

It is also the intention of the Admiralty to send a vessel to re-survey the Strait of Magellan, and to examine those remarkable inland channels which, extending nearly 400 miles along the western side of South America, enable large steamers to enter the Pacific in a comparatively low latitude and tranquil sea, and thus avoid the boisterous region of Cape Horn, with its storms and icebergs. Geographers will not fail to remember that Patagonia and Tierra del Fuego have been the scene of the labours of some of our most eminent explorers and surveyors, but natural causes produce changes more or less affecting navigation on most coasts, and the requirements of the seaman keep pace with the march of time.

Moreover, the rapid strides which science and art have made within the last quarter of a century demand that the improved means and appliances which they have placed within our reach should be turned to account for the improvement of navigation, and the consequent advancement of commercial enterprise and prosperity.

METEOROLOGY.—I invite with much satisfaction your attention to the Report of a Committee appointed to consider certain questions relating to the Meteorological Department of the Board of Trade, which I consider to be one of the most valuable documents ever laid before Parliament and the public in the form of a Blue Book, whilst it must be peculiarly interesting to all geographers. Upon the lamented death of Admiral Fitzroy a correspondence took place between the Board of Trade and the Royal Society respecting the future conduct of the Meteorological Department; and a Committee, formed in consequence, and consisting of our associate Mr. Francis Galton, Commander Evans, R.N., and Mr. T. H. Farrer, have prepared a clear account of the best measures to be taken to procure meteorological statistics of the ocean, or as respects weather telegraphy, in or affecting the British Isles.

In the numerous observations made at sea, and collected first by Maury, in 1852, and in the suggestion during the same year by Sir John Burgoyne, to establish meteorological stations on land, we mark the rise of a new branch of meteorological statistics. Through the subsequent co-operation of the Royal Society and its President General Sabine, as well as by the recommendation of a Congress held at Brussels, this system was brought into operation under

the Board of Trade with Admiral Fitzroy at its head. That eminent man commenced by carrying out the wishes of the Royal Society, but in the sequel was overpowered by the enormous accumulation of materials collected at sea through the united efforts of the naval and mercantile marine of Britain, and the registering of all these data was abandoned. The Committee urgently recommend the resumption of the registering of all the meteorological observations made at sea, and describe the best methods to be followed in extracting observations.

It further appears that much remains to be done in completing the desiderata pointed out by the Royal Society relating to barometric pressure, aqueous vapour, temperature of the atmosphere and surface of the sea, temperature, direction, and velocity of ocean currents, and limits of the trade winds and monsoons. Good practical suggestions are offered in relation to the works now in progress or to be executed, and as to the method of tabulating and publishing the results of meteorological and other observations useful to navigation.

After giving a sketch of the history of the foretelling of storms by means of telegraphing the state of the weather at great distances, as practised so successfully to a great extent by Admiral Fitzroy in this country and in foreign countries by Le Verrier, Dové and others, and after pointing out the great difference between the power of foretelling great occasional storms and the uncertainties of daily forecasts, the Committee use these words:—"The practice of issuing daily official notices of the weather, the truth of which is warranted neither by science nor by experience, is inconsistent with the position and functions of a Government Department, and must be prejudicial to the advancement of true science."

On the other hand, they advocate the continuation of the publication of telegraphic reports and remarks, and the issuing of storm warnings. Respecting the latter it is believed that, so far as they indicate the force of the wind, they are sufficiently correct to be of some value; but that, so far as they indicate the direction as combined with the force of wind, they are not sufficiently correct to be of real value. It is anticipated, however, that more accurate observation and more careful use of the materials already on hand may, at some future time, lead to a more successful result in these popular warnings.

Adopting the recommendation of the President and Council of the Royal Society, that stations shall be established for self-recording observations, and after a minute and detailed analysis of all the

means to be employed and the expenses to be incurred, the Report concludes in these words which have much gratified me. "If a more scientific method should hereafter succeed in placing the practice of foretelling weather on a clear and certain basis, it will not be forgotten that it was Admiral Fitzroy who gave the first impulse to this branch of inquiry, who induced men of science and the public to take interest in it, and who sacrificed his life to the cause."

In regard to the broader subject of weather-changes in all parts of the world, I cannot do better than extract one of the final passages of this able Report, as being of great interest to geographers.

"Considering (say the reporters) the wide extension of civilization and of British colonization and influence, it seems only reasonable that we should possess some regular record of the broad peculiarities of all the great weather-changes that affect the globe. A knowledge of the various regions of exceptional drought, of wet, of heat or of cold, of the deflection of normal currents of air or of the sea, of the variation of the limits of the polar ice, and other phenomena is required; and for this purpose much more of course will be needed that either the ocean statistics or the weather-changes in and near the British Isles, which form the special subjects of our recommendation. . . . We look forward, however, to the establishment, at no distant period, of a regular record of the weather-changes over the greater portion of the globe, through international effort, and especially by means of the observations of British subjects on shore and afloat." \*

NEW PUBLICATIONS.—The new publications of a geographical nature which have appeared during the year in this and in other countries, are, as in previous years, too numerous for me to pretend to pass

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\* The general conclusions arrived at by the authors of the Report are to the following effect:—

1. The collection of Observations from the captains of ships to remain with the Board of Trade.

2. The digesting and tabulating Results of Observations not to continue under a Government Department, but to be wholly under the direction of a scientific body,—such as a Committee of the Royal Society or of the British Association.

3. The procuring and sending daily telegrams and the issuing of Storm-warnings to be under the charge of the same body.

4. For these purposes an annual vote of 10,500*l.* would be required to be granted, on the condition of rendering a yearly account and report to Parliament, leaving to the scientific body entrusted with it perfect freedom in their method and in their choice of labour.

5. The existing Observatory of the British Association at Kew, with the addition of a small branch establishment in London, might be easily developed to carry this scheme into effect.

them all in review, however briefly. The 'Mittheilungen' of our honorary associate Dr. Petermann has appeared during the last twelve months with its usual regularity, and has contained, besides a number of original memoirs and illustrative maps, a *resumé*, from time to time, of current geographical literature. This repertory of valuable information must necessarily be consulted by all who make geography their study.

With regard to other works published on the Continent, I shall presently make mention of M. Pauthier's edition of 'Marco Polo,' one of the most important books of the year. Another work of much interest, relating to Asia, has appeared from the pen of Dr. Bastian, entitled 'Die Völker des Östlichen Asien in Studien und Reisen,' the result of five years' researches in Eastern Asia. Dr. Bastian is known to us as having contributed a memoir to the last volume of our Journal, on the ruined cities and buildings of Cambodia, and has devoted himself with great ardour and conscientiousness to this line of research. The work here mentioned is to extend to five volumes, two of which have now been published.

In our own country, the appearance of several books of travel and geographical works, richly illustrated in chromo-lithography, seems to me to be well worthy of notice, as I have often had occasion to express my regret that valuable series of drawings sent home by travellers should remain unavailable, owing to the cost and difficulties of publication. Amongst this class of works issued during the past year by Messrs. Day and Son, is a volume on Madagascar, by our associate Lieutenant Oliver, containing many coloured illustrations, which convey a vivid idea of the scenery and people of this interesting island. Baines' Views of the Victoria Falls have also been published, and the same firm have now in preparation a fine series of views on the Niger by Mr. Valentine Robins, which were exhibited lately at one of our meetings, and Gully's magnificent sketches of mountain and glacier scenery in New Zealand, sent to this Society by Dr. Haast, and commented upon in my Address of 1864.

During the year two parts of the new edition of Fullarton's 'Imperial Gazetteer of England and Wales' have appeared; a work containing many plans of cities and towns, as well as numerous excellent maps, which must render it of the highest utility. A supplement to 'Blackie's Imperial Gazetteer' has also been lately published.

Lastly, amongst the works which have appeared in our own



country, I must mention the volume of 'Sailing Directions for the Indian Ocean,' from the pen of the accomplished geographer Mr. A. G. Findlay; a work in which is stored an immense amount of hydrographical and geographical information, and a worthy continuation of the series of books of a similar nature which the author has published.

*Marco Polo and Mediæval Travellers to China*.—Whilst our associate Colonel Yule has been occupied during the last year in producing a work on mediæval travels to China, for publication by the Hakluyt Society, an abstract of which has been recently sent to us for reading before our own body, M. Pauthier, the well-known Oriental and Chinese scholar, has brought out in Paris a work which must be highly interesting to all comparative geographers, under the title of 'Le Livre de Marco Polo.\*' By publishing for the first time the original manuscripts in the old French of the 13th century, which have long lain in the National Library of Paris, and which were dictated by the great traveller in his prison at Genoa to his secretary Rusticiano di Pisa, M. Pauthier has done much to establish the fidelity of the narrative. Whilst the man of letters will luxuriate among the copious illustrations of the subject, whether in notes and commentaries, or in the references to a multitude of authors, who, besides our gifted countryman W. Marsden, have written upon Marco Polo, as well as in the supplemental historical chapters attached to this work, it is to the map especially of M. Pauthier that I would direct your attention. This map has great merit, both from its clear definition of the main physical features of the vast regions travelled over by the Commissary and Envoy of the great Mongolian Emperor Khubilai Khan, and also from having the names of the countries and places which were in use at that period, inserted in red letters, alongside of their present names as given in ordinary type. One of the main points of M. Pauthier is to show that the most reliable version of the travels of Marco Polo is that which was written in the French of the 13th century, then the language of chivalry and poetry, and which was corrected by the traveller himself. For, if the narrative was first given in the Venetian dialect, the Italian versions were, it is thought, taken from the old French manuscripts which in that age passed through the courts of France

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\* 'Le Livre de Marco Polo, citoyen de Venise, Conseiller privé et Commissaire Imperial de Khoubilai Khan, rédigé en Français par Rusticien de Pise,' &c. Paris. Firmin-Didot Frères. 1865.

and England, in which the romances of this very Rusticiano di Pisa were in vogue.

Leaving this critical question to be settled by scholars, we as geographers must hail with satisfaction this accession to the illustrations of the travels of Marco Polo, the Paladin of explorers, who not only first broke through the clouds of ignorance of the middle ages respecting the various countries of the earth, and prepared the way for the discoveries of Columbus and Vasco de Gama, but who also brought from China the first types of printers. What then would have been the admiration excited if in the lifetime of the illustrious Venetian, instead of having his story recited from scarce manuscripts, it had then, or shortly after, been circulated through Europe with the types of a Gutenberg and a Caxton.

Let us therefore applaud the words of M. Walckenaer, quoted by M. Pauthier, who has said that of the three men who in the grandeur of their discoveries have most contributed to the progress of geography or a knowledge of the globe, the modest name of the Venetian traveller may well be placed in the same line as that of Alexander the Great and Christopher Columbus.\*

EUROPE.—*Eruption near Santorino*.—Our attention has recently been awakened to one of those sudden outbursts of volcanic matter which in the most ancient historical times have actually produced certain islands in the Ægean Sea, the largest of which is Santorino, or the ancient Thera. That island and the adjacent isles of Therasia and Aspronisi are simply segments of the former rim—the now broken edge—of one stupendous volcano, the crater of which is six to seven miles in diameter, and has been for ages a deep sea-bottom. From time to time a central portion of this vast crater has been subjected to renewals of this volcanic activity, and of these this Society was furnished sixteen years ago with abundant proofs in the able account given by Lieutenant Leycester, R.N., as published in the 20th volume of our Journal.† Referring back to Pliny, Strabo, and others, for the accounts of the earlier eruptions and subsidences,

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\* I must not omit to mention that a most valuable article on M. Pauthier's work has just appeared in the French 'Journal Asiatique' (for April—May, 1866), from the pen of M. Khanikof, a man who is admirably qualified to illustrate the routes of Marco Polo in Persia and the western part of Central Asia. The article is of some length, and written with peculiar clearness and force. This learned Orientalist seems to me to have clearly established the site of all the localities visited by Marco Polo in these countries, and to have thus contributed to remove our ignorance of the state of Persia and Central Asia in the thirteenth century.

† See also a full account of the phenomena in Lyell's 'Principles of Geology,' 9th edition, pp. 441 *et seq.*

he acquaints us that the tract remained in a state of quiescence for upwards of seven centuries, when the volcanic forces became again active in 1457, and were renewed in 1573 and 1650. After this last date all was tranquil in and around Santorino for fifty years: its vineyards were once more prolific, and the older inhabitants only could recollect the terrestrial revolution, when in the year 1707 the little island of Neo Kaimeni, to the west of Santorino, and lying between the Palæo and Mikro Kaimenis of former eruptions,\* arose from the sea to the height of about 250 feet, and having the circumference of about a mile. At that time the surface was more or less disturbed at and around this spot for six years, and the action terminated in 1712 only. The dark-coloured insular rocks of the Kaimenis or Burnt Islands, thus formed, proved an inestimable advantage to the natives, in affording safe ports inside the grand old crater of Santorino.

It is just at this locality that the recent changes have occurred by which one newly-elevated mass of rock, composed of scoriæ and lava, has been added to the island of Neo Kaimeni, which has partly subsided, whilst another small island has been formed. Geologists might certainly have well speculated on the renewal at any time in this locality of such a phenomenon as that which has excited so much attention, not merely by looking back to historical records, but simply by the knowledge we have long had that the sea-bottom on this particular spot, the Bay of Exhalations, where the last changes have taken place, has been for many years affected by the emission of mineral springs containing sulphuric acid gases, which, oozing out in a natural harbour, the sides of which were formed by erupted masses, have rendered this anchoring-ground a bath in which the foul copper bottoms of ships have been in a short time cleansed of their impurities.

The antiquary will find in the account of Lieut. Leycester the description of the various temples and monuments of Greek art which were mutilated and destroyed by the former changes of the land, arising from eruptions and their concomitant earthquakes; but the chief point to which I wish to direct your notice is that the oldest eruption which has ever occurred on the site of this occasional vent of volcanic activity was on an infinitely grander and more colossal scale than any which have succeeded to it, and also

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\* The first of these rose in the year 197 before Christ, the second in A.D. 1573, and this has still the remains of an old crater. Another island appeared on the north-east coast of Santorino in 1650, but soon disappeared.

that each succeeding outbreak in this crater has been milder than its predecessors. These facts sustain a view which, as an old geologist, I have long entertained, namely, that the subterranean forces which anciently affected the surface and changed the outlines of the earth were of a more intense nature than those which now prevail. This view is countenanced in the region of extinct volcanoes of Asia Minor, and in the grand primeval outflows of Etna or the former activity of Vesuvius when its showers of pumice and ashes destroyed Pompeii. By comparing these with all subsequent outbursts of these several volcanoes, to say nothing of the volcanoes of Auvergne and the Rhine, which have been quiescent during the whole historic era, we see how the activity along visible vents of eruption has successively diminished.

The special interest, therefore, connected with the appearance of these new islets in the Ægean, is that they are miniature and feeble evolutions of the forces which were employed on a gigantic scale in those antehistoric periods when submarine deposits were raised into continents and vast tracts of land were submerged, in some cases by gradual operations working during countless long periods, in others, as I believe, by sudden and spasmodic elevations and subsidences. The geographer, antiquary, and geologist are all equally interested in studying these changes of the earth's outline; and hence it is that such a truly classic work as that of our associate Capt. Spratt on Crete, or the memoir on Santorino by Lieut. Leycester,\* to which I have referred you, must be so highly prized by every one who is embarked in such studies.

In addition to the accounts of the last eruption in the Ægean Sea, as forwarded to us by the Earl of Clarendon, including the despatches of the Hon. E. H. Erskine, H.M. Minister at Athens, the description and drawings of M. Schmidt, a despatch of our associate Captain Brine, R.N., and others, the letter of M. Fouqué to the Eparch of Santorino, which was last received, is the most important to us as men of science. Sent thither by the French Academy of Sciences, and accompanied by a member of that body, my old associate M. de Verneuil, M. Fouqué has confirmed the view which I had already taken regarding the comparative feebleness of this eruption. Instead

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\* Lieut. Leycester wrote his sketch when serving under our accomplished associate, that sound naval surveyor Capt. Graves, of H.M.S. *Volage*; and the map to illustrate the paper is by Lieut. Mansell of that vessel. The subject of the recent eruption has been fully discussed by the French and Prussian geographers, and, doubtless, the full report of M. Fouqué, when published by the Academy of Sciences will be very instructive.

of being a cause of dread and fear to the inhabitants, this escape of the pent-up steam and sulphureous gases, through two small orifices and a fissure which unites them is, he justly considers, a safety-valve of great advantage to Santorino; and that a proper equilibrium being thus established between the volcanic materials beneath the surface of the earth and the atmosphere, the earthquake shocks to which the surrounding region is subject will be diminished. Following out the views of M. St. Claire Deville, M. Fouqué shows, that the intensity of volcanic eruptions is always to be measured by the nature of the materials and gases emitted; and judging from what he has collected at Neo Kaimeni, as compared with the emissions of Etna and Vesuvius, he places this recent event in the *Ægean* in the least active of his four phases of intensity of igneous action. Another important observation of M.M. Fouqué and De Verneuil, showing the very local character of this eruption, is that it has produced no change of level in the land of the adjacent islets of Mikro Kaimeni and Palæo Kaimeni, nor even on the northern part of Neo Kaimeni itself.\*

It is right, however, to state, that in a despatch to the Earl of Clarendon, Mr. Consul Lloyd, who differs from some of the views of M. Fouqué, informs us, on the distinct authority of the Commander of a Prussian surveying vessel, that the channel between Neo Kaimeni and Palæo Kaimeni, which formerly had a depth of more than 100 fathoms in the deepest part, has now only a depth of 50 fathoms; and Mr. Lloyd further suggests that as the isle of Aphroessa is increasing, this depth will still more diminish near it, as well as in the waters near the George Promontory. All the phenomena have indeed been elaborately developed by a Greek Commission and Commander Palaska; whilst the best map representing the recent changes has been published by Petermann. As it had been a matter of doubt among some geologists whether flames ever issued from terrestrial volcanos, the well-ascertained fact of real scientific interest attached to the recent evolutions of Santorino is the proof they have afforded of the undoubted presence of flames, whether issuing from the crater or through the cracks and fissures in the newly raised scoræ.

*Switzerland*.—Our excellent Corresponding Member Mr. J. M. Ziegler has this year sent me his usual report of the progress of the Swiss surveys, and with such fulness of interesting detail that it

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\* A translation of this interesting letter of M. Fouqué will be published in the 'Proceedings.'

would well deserve more space than I can give it in this Address. The great Federal topographical map was finished last year, and the Swiss Geodetical Commission is now taking an active part in the measurement of a meridional arc, entrusted to the International Geodetical Board by different Governments of the Continent. Another task of the Commission is the verification of heights, the determination of the elevation of the Pierre du Niton (Geneva), by successive levelling from Marsilles, having rendered it incumbent on their part to verify the difference of altitude between the Pierre Niton and the Chasseral, or determinating height of the Swiss survey.

The hypsometrical map of Switzerland, compiled by M. Ziegler, and published this year at Winterthur, is remarkable for the clear way in which heights are represented by tints, and gives the latest and most accurate view of the geography of Switzerland. It is accompanied by a treatise on the hypsometry of the country and orography of the Alps, in which the author gives a comparison of the mean depressions of valleys and mean altitudes of mountain-ridges, and which should be consulted by all who are interested in the physical geography of this country so fertile in subjects of scientific interest.\*

*Spain.*—I cannot avoid allusion to a work published last year, under the authority of the Spanish Government, by Don Pedro Antonio de Mesa, giving a physical and hydrographical account of the basin of the Ebro. The author says that it is based on the same principles as the Memoir on the Guadalquivir already published, and he commences his work by a geographical description of the position and extent of the basin, being the most northern region of the peninsula, and having a maximum breadth of 270 kilomètres, and a maximum length from Peña Labra to the island of Buda of 520 kilomètres. It contains twelve out of the forty-seven provinces of Spain, with a superficies of 83,530 square kilomètres. It is divided into three portions, upper, middle, and lower, and contains four great secondary basins, corresponding with its four principal affluents, viz. the Jalon, the Aragon, the Gallégo, and the Ségre, the three latter of which descend from the Pyrenees.

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\* I am indebted also to Professor Paul Chaux of Geneva, another of our Honorary Corresponding Members, for some further details regarding the advances made towards a more accurate knowledge of the physical geography of Switzerland and the neighbouring countries, some of which are of geological rather than of geographical interest. He informs me that M. Dausse, in a contribution to the Helvetic Society of Naturalists, on the past and present state of the lakes of Lombardy, admits that some of these lakes were formerly united in one large basin, including the present lakes of Varese, Lugano, Orto, and Lago Maggiore, discharging its water through the south end of the lake of Orta, and the valley of the river Aegna.

In this elaborate work the author describes, further, all the affluents of secondary and even third-rate importance, gives a detailed account, accompanied by many cross sections, of the different regions through which the river flows, and the various ways in which the water is utilised, concluding by describing the great canal and irrigation works now projected, or in course of construction, in the lower course of the Ebro. Other minor works and canals are carefully detailed, and the author endeavours to show the capacity of the different rivers, together with the best means of applying the water supply to the various wants of the province, and the proportion in which it should be done.

ASIA.—*Researches of Russian Geographers*.—Through the kindness of M. F. Osten Sacken, the Secretary of the Imperial Geographical Society, I learn that Prince Krapotkine made a journey in a mercantile caravan from Tsuruhailovietsk,\* on the river Argun (s.e. of Nerchinsk), to the city of Merghen, in the province Heluntsiang of Chinese Tartary, and thence to Blagovestchensk on the Amur. This country was previously known only from hearsay and old Jesuit maps, and the author brings to our knowledge the new and interesting fact that in these interior lands, and 900 versts from the sea of Japan, there is a true volcanic tract, called Niun Kholdengi, in which a volcano was in activity in the last century, and minutely described by M. Wassilief, a celebrated Chinese scholar. Prince Krapotkine has gone far to settle the question by a survey of the country immediately surrounding the point of eruption, as he has there found basalts, lavas, &c. He was not, however, able to visit the old focus of eruption.

On the southern coast of Mandchuria, a region of which we have till lately been very ignorant, it appears from the researches of MM. Bendestchaff, Timroth, and Helmersen, that a profitable fishery in crabs, sand-eels, and sea-weed is carried on in the bay of Passiet; the sea-weed forming an article of food sent to Gherin and thence to China proper.

In Eastern Siberia the result of the examination of the river Vitim is looked to with great interest. In Central Asia and along the new line of the Russian boundary M. Struve has determined ten new astronomical points, among which are Tchemkend, Taschkend, Tchinaz, and the fort of Turkestan. Some of the corrections are considerable; for Taschkend is moved 37' of latitude and 30' of longitude to the s.e. from the position assigned to it in the last

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\* Zuruchaitui in English atlases.

map of Central Asia, published by the Russian Topographical Dépôt.

By recent intelligence from Russia, I learn that a Siberian expedition was in progress on the 21st March last, under the management of M. Lopatine, to explore and report upon the physical geography and productions of the region near the mouth of the Yenissei, where that large stream falls into the glacial ocean. Former travellers had not, it appeared, advanced beyond  $72^{\circ}$  N. lat., or to the isles of Broikow; but it has been said that large quantities of cod and other fish exist still further north. At those islands, the river, having a width of 60 versts, its rocky banks covered with soil, takes a north-westerly direction, whilst the hills, which it quits, range to the north-east. In its course northwards from Turukkansk, the Yenissei passes through those great and sterile flats so common in Northern Siberia, and known as the *Tundras* of the natives; and finally, when it enters the glacial sea, black rocks (supposed to be carboniferous) form its flanks. During the progress of this expedition the important discovery has been made of entire skeletons of mammoths, whose skin and hair have been preserved in frozen mud, like those of the specimen found many years ago near the mouth of the Lena, and long exhibited in the Museum at St. Petersburg. It is further stated that the heads of these extinct elephants were, for the most part, turned towards the south, as if the animals had been retreating southwards when caught either by an inundation proceeding from the North Polar region, or by a change of climate due to a wide elevation of land, their former pasture grounds being converted into the frozen soil in which the mammoths have been preserved to this day. If this account be substantiated, it offers new data for the reasoning of Geologists, who have hitherto had great difficulty in accounting for the prodigious quantities of mammoth tusks or ivory found in the Liakow Isles (New Siberia) in N. lat.  $75^{\circ}$ , as well as in Eschscholtz Bay, in Behring's Straits, without inferring that these remains had been transported from lands on the south and from the flanks of the Altai and Ural Mountains. But the preservation of so many entire animals of this size in such high northern latitudes induces me to modify somewhat the views I formerly entertained,\* and to suggest that all northern Siberia, which is now so glacial, was, during the age in which the mammoth lived, a continent covered with a vegetation adequate to support vast herds of these huge animals, even up to  $75^{\circ}$  N. lat.

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\* See 'Russia in Europe, and the Ural Mountains,' vol. i. p. 492, *et seq.*



This view is, indeed, sustained by the researches which have been made from north to south; for, when we travel southwards, we find the mammoth remains becoming much scarcer, and, instead of whole animals, we meet with their broken and disjointed bones only, as if they had been transported from the north. Having satisfied myself by wide personal examination that other drifted materials, which proceeded from north to south, cover large regions of European Russia, Prussia, and Northern Germany (in many places superposed by those great erratic blocks which were conveyed in former icebergs), and seeing in our own islands similar evidences, I now infer that the chief masses of such *marine* drift were deposited whilst a prodigious change of climate was being effected over the northern hemisphere, large portions of which, like Northern Siberia, antecedent to such perturbations, were *low lands* indented by *marine estuaries*—whilst other countries, as Russia in Europe and Northern Germany, were then entirely under the sea. The simple fact alone of the absence of all northern drift, or of any erratic blocks over all Siberia, is, indeed, in direct contrast to the state of the surface of European Russia, Northern Germany, and the British Islands, and shows us, that when the great, and possibly sudden, change of climate occurred, by which the mammoths were destroyed and entombed *in situ*, Northern Siberia was largely inhabited by those animals.\*

As respects Central Asia, I may state that, at a late monthly meeting of the Imperial Geographical Society of St. Petersburg, a remarkable memoir was read by Colonel Heinz, relating to the Mahometan people of Western China, called Dungans (Doungans in French), who are in actual revolt against the governing or Mandchu Imperial dynasty.

With the exception of the inhabitants of Chinese Turkestan, these Dungans, constituting, according to this author, a population of thirty millions, occupy in great numbers the provinces of Kan-si, Chem-si, Szechuan, and Yunnan and tracts north of the Thian Chan Mountains. From a residence, during the year 1865, among the Kirghis on the Russian frontier, Colonel Heinz obtained much curious information respecting these people and the origin of their quarrel with the Mandchu Tartars in the town of Si-ngang-fu. He is of opinion that the insurrection is too wide-spread and deeply rooted to be put down by the present feeble Government of China.

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\* See Lyell, 'Principles of Geology,' with citations from Pallas, Wrangell, Baer, and Middendorf, pp. 79 to 86.

In the discussion which followed the reading of this paper, differences of opinion were expressed as to the real number of Mahometans inhabiting China.—no one, however, placing it below twenty millions; whilst, on the whole, it seemed apparent that a religious element was at the bottom of an insurrection which has spread from the interior province of Chem-si or Shem-si towards the Russian frontier.

Considering the apathy of the Chinese Buddhist, and how a spurious and debased imitation of Christianity was rapidly propagated by the fanatical Taipings in other provinces, who can say that, if powerful leaders should arise, Islamism may not soon overspread a wide area of the Chinese Empire!

*Region of Central Asia, between the Russian Frontiers and British India.*  
—At our last anniversary, when I treated of the new frontier of Russia along the Khanat of Khokand, I directed your notice to the extensive and lofty region which lay between that line and Cashmir, the north-western advanced post of British India. Recently our attention has been called to a large portion of this almost unknown territory, in the great intermediate ocean of sterile mountains bearing the general name of “Pamir,” an account of which was given to the Imperial Geographical Society of Russia by M. Veniukof, founded on a manuscript narrative of travels which was lodged in the Topographical archives of St. Petersburg in the year 1806.

After M. Veniukof's memoirs were translated, for our Society, from Russian into English, the quotations in them from the MS. narrative were found to contain so many anomalous and inexplicable statements, as well as mistakes of names, &c., that two of our best Oriental scholars, Lord Strangford and Sir H. Rawlinson, were induced to think that the Russian Government of that period had been imposed upon, and had purchased a made-up document not founded on true observations. Sir H. Rawlinson, indeed, gave us an elaborate criticism upon this narrative, purported to be written by Herr Ludwig von ———, an unknown German, who it was said, when employed by the India Company, went into the tableland of Pamir to purchase horses for the cavalry, accompanied by sepoys and a Lieutenant Harvey. Since this sterile country, as far as is known, contains small horses or mere ponies only, wholly unfitted for the use of cavalry, and as no record could be found of any such officer as Lieutenant Harvey, it was very natural that Sir H. Rawlinson, who had taken great pains to inquire into the facts, in the

desire to ascertain the truth, should have been led to throw serious doubts upon the narrative. On writing to my friend M. Khanikof, the accomplished Russian geographer, who has explored and described large portions of Persia and Central Asia, and who, two years and a half ago, wrote to me about this very Pamir land, I received from him an explanation, of which the following is the substance\* :— M. Khanikof admits that certain inaccuracies in the narrative of the nameless German may have justified the doubts of Sir H. Rawlinson; but adds that in order to form a correct judgment our geographers must wait until they examine the original documents. For, besides the narrative, there are maps which, considering the period of their execution, are so very good as to have convinced the Russian geographers that they were laid down upon the spot, and after good astronomical observations. Now, those topographical works have never been seen out of the archives of St. Petersburg, and they constitute by far the most important part of the subject. The imperfect narrative must have been composed (M. Khanikof thinks) long after the survey was made, and by the person who brought the maps for sale to the Russian capital in the year 1806: it being further believed that the survey was made during the last twenty years of the last century, several substantial reasons for which are assigned. In showing that there is a mixture of truth with a good deal of inaccuracy (indeed Sir H. Rawlinson also had stated as much), M. Khanikof relies mainly on the authenticity of the map, and seeing its close approximation to accuracy in those continuous tracts where observations have already been made, particularly along the course of the Syr Daria or Jaxartes, he is of opinion that the survey must have been faithfully made in the very region it illustrates.

Whether or not this explanation of M. Khanikof will prove satisfactory to our learned critics, I cannot but hope that we shall ere long obtain copies of the maps, which are, after all, the materials to interest us much more than the defective narrative.

Among the numerous desiderata which remain to be worked out by geographers—a long array of which I mentioned in the *Address* of last year—the great table-land of Pamir, as well as vast adjacent

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\* This letter will be published in our Proceedings. Whilst this sheet is passing through the press, I have received a second and much longer letter from M. Khanikof, who, having in the interval visited St. Petersburg, and carefully studied the narrative and maps of the unknown German, has discussed in detail nearly all the objections made by Sir H. Rawlinson, and has so far vindicated the general accuracy of the mysterious traveller. This letter will also be published in our Proceedings.—June 26th, 1866.

tracts of wild countries, still remain to be surveyed by topographers. For although Lieutenant Wood visited the source of the Oxus, and several others of our countrymen have explored adjacent tracts, still the old map in the possession of the Russians, as described by MM. Khanikof and Veniukof, must be viewed as a curious document. In the mean time I have only to hope that in the sequel British and Russian explorers may meet in this hitherto unknown territory to determine its exact physical features. Even granting that the map of the nameless German is found to be truthful in its broad outlines, the instruments used by geographers in the last century were comparatively defective. The valleys and uplands of Badakhshan and Pamir, lying to the north of the lofty Hindoo Kush, will therefore I trust, remain for ages to come the neutral ground between British India and Russia, in which the geographers of both countries may meet to promote the science which they cultivate, and much of the advancement of which in Central Asia is already due to the labours of our Northern allies.

Of another part of this wild region, concerning which we have heard little since a portion of it was described by the brothers Schlagintweit, we had an interesting account at our last meeting in the paper communicated by our medallist Captain Montgomerie. This is the country extending northwards from the Karakorum Pass to the city of Yarkand, in Chinese Turkestan, and through which flows the river Karagash as it descends from the Western Himalayas. This tract was explored and surveyed in 1863-4 by a native Moonshee, engaged by the Indian Government, furnished with proper instruments, and duly instructed by Captain Montgomerie, who was then directing the Great Trigonometrical Survey in Cashmir, Ladak, and the surrounding countries. Residing for some months at Yarkand, this envoy made many astronomical observations which determined the position of the city to be  $38^{\circ} 20'$  N. lat. and  $77^{\circ} 30'$  E. long.; thus showing certain differences between his results and the estimates of the French Jesuits on the one hand, and of the Schlagintweits on the other. The altitude of Yarkand was ascertained to be about 4000 feet above the sea-level, and the climate in winter to be so severe, that the thermometer, early in January, sank nearly to zero. We also learn from this native traveller (who unfortunately died on his return just after he crossed the mountains into country under British protection) that the precious stone called jade (the Nephrite of mineralogists) occurs in some quantity on the banks of the Karagash.

Now, as this mineral is also found in that part of Eastern Siberia watered by a great affluent of the Amur, whence the large block of it in the British Museum was brought by M. Alibert, we know that this stone, so prized in China, occurs at intervals through a wide space of Central Asia.

On this occasion Captain Montgomerie gave us a vivid picture of the grandeur of these mountain ranges, so large a portion of which has now been accurately laid down by the Great Trigonometrical Survey. The journey of the Moonshee has enabled him to ascertain that from Jummo, or any point in the Punjab at the foot of the Himalayas, it takes a man, assisted by a pony, sixty-six days to cross the mountains, and during that period the road lies for twenty-five days over country never lower than 15,000 feet, and for forty-five days never below 9000 feet above the sea-level. The elevated ranges may therefore be said to be at least 400 miles across at their smallest breadth. During the years which the Survey has been directed in these regions by Capt. Montgomerie, he has informed us that the whole of the Karakorum and Mustakh range has been defined, forming the boundary between Little Thibet and Turkestan; and that the altitude of the peaks for 450 miles varies from 21,000 to 28,500 feet, a very much higher range than that of the Himalayas to the south of Ladak and Little Thibet.

The description given by Capt. Montgomerie of the appalling difficulties overcome by the surveyors under his direction, when they explored this lofty chain, made a profound impression on all who heard him, and we have only to hope that our Medallist and his gifted associate Capt. Godwin-Austen will ere long make known to us the true physical geography of the vast region which lies between the sources of the Indus and those of the Brahmaputra.

Before we quit the consideration of these lofty mountains in Asia, I must particularly advert to the last number published of the splendidly illustrated fasciculi in folio, prepared by the brothers Hermann and Robert von Schlagintweit. Besides the meteorological data communicated both in the letter-press and in instructive tables and diagrams, the sketches, printed in oil-colours, are most striking and effective; particularly those which represent the great snowy chain of the Kuen Lun in the distance, from Sungal in Turkestan, and the Salt Lakes of Tsomoriri and Tsomognalari in Western Thibet.

*Great Trigonometrical and Topographical Survey of India.\**—The great

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\* Abridged from a memorandum by Colonel Thuillier.

triangulation of Hindostan has extended now over at least three-fourths of the entire area of that country, fixing the true positions of all the chief cities, towns, and places of importance. One of the blanks to be filled up is in Eastern Bengal and Assam, comprising the whole of the lower provinces east of the meridian of Calcutta. The extension of the great longitudinal series of triangles from Kurrachee in Sindh to Calcutta, is now being carried eastwards along the parallel of  $23^{\circ}$  N. lat. to the extremity of the British frontier, to tie another meridional series progressing southwards from the Cossyah mountains, in about  $92^{\circ}$  E. long., down the frontier towards Arracan and Rangoon; and the point of junction has been effected just below the British station of Tipperah or Comillah. This quadrilateral, which embraces all Bengal Proper east of the meridian of Calcutta (with the exception of a portion of the Brahmaputra River and Upper Assam, which will be separately provided for), will require an intermediate series of principal triangles to fix the city of Dacca and other places of importance in Eastern Bengal on the meridian of  $90^{\circ}$  E. long.

The northern longitudinal series, from the Sonakhoda or Darjeeling Plains base, up the valley of the Brahmaputra River, is completed as far as Gowhatty in Assam, and it will hereafter be continued in a north-easterly direction to the extreme limits of the British frontier on the borders of Thibet and Burmah.

The remaining work to be done by the trigonometrical operations lies in Central and Southern India, and on the Coromandel coast, below the parallel of  $23^{\circ}$  N. lat. A principal series has long been in progress along the coast from Calcutta towards Madras, which place it has nearly reached. Another base of verification has lately been measured at Vizagapatam.

Between the coast and the great arc series, on  $78^{\circ}$  E. long., a large tract of difficult and but little known country has to be taken up. This large ellip-oidal figure, comprising Berar, Gondwana, the Jungle-Mehals, Sirgoojah, Sumbhulpoor, the Khond country, Goomsur, &c., perhaps some of the most unhealthy parts of India, is now being provided for by meridional series of principal triangulation, extending southwards from the great longitudinal section, on the meridians of  $80^{\circ}$ ,  $82^{\circ}$ , and  $84^{\circ}$  E. long. These will be tied by another cross longitudinal section from the Vizagapatam base to the Beder base, on the parallel of  $18^{\circ}$  N. lat., and so across the peninsula to Bombay, in the vicinity of which another base will have to be measured, and which will complete two more grand quadrilaterals

(verified by six bases\*) of about equal areas to the northern ones.

The whole of the southern peninsula below the parallel of  $18^{\circ}$  has been covered by a network of triangulation, performed many years ago, with less pretension to the scientific accuracy of the later operations, and with inferior instruments. To perfect the great work according to the system of modern refinement pursued for some years past, the Coromandel coast principal series will have to be prolonged from Madras to Cape Comorin and Ceylon, with a cross section from Madras to Bangalore and Mangalore, in  $13^{\circ}$  N. lat., and a fresh series on the meridian of Mangalore, in  $75^{\circ}$  E. long. This will divide the southern peninsula into four remaining smaller quadrilaterals, which will be checked by additional base-lines, to be laid down at Bangalore, at Cape Comorin, and at Mangalore on the western coast. An independent base will likewise have to be measured at Rangoon, to check the very long meridional series which will connect Pegu and the Tenasserim provinces on the eastern coast with eastern Bengal. A chart of all the existing and proposed triangulation has been deposited in the library of the Society.

On the rigorous basis of triangulation adopted, which is carried out with the largest instruments and all the refinement due to geodesical operations of the first order, the topography of an enormous area has already been laid down. Those portions of India which are exclusively British possessions, and fall within the regular assessment of the land revenue, are delineated on the 4-inch scale. This is reduced and published on the 1-inch scale, and further reduced for incorporation into the General Atlas of India, published in England on copper on the  $\frac{1}{4}$ -inch scale. The native independent, or tributary states or possessions, are surveyed on the 1-inch scale only, the standard scale for all general maps, and which is sufficient for military or government purposes, and where no revenue is derived from the land.

Assam, Upper and Lower, now growing into great commercial importance, remains to be taken up, and will be immediately entered upon, with the view to a regular settlement of the country, and the definition of the numerous tea plantations and grants of waste lands

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* Calcutta .. .. .	} Coast.
Vizagapatam .. .. .	
Belur .. .. .	
Suenj .. .. .	} $78^{\circ}$
Bombay .. .. .	
Karrachee .. .. .	} Coast.

made under the fee simple rules. The territory recently ceded by Bhootan, and now known by the name of the Bengal Dooars, is now occupied by the surveyors, who are defining the northern line of frontier. A preliminary sketch map of this tract of country, which is most unhealthy and difficult of access, has been brought out for the guidance of the troops employed, but owing to the great jealousy of the Bhootas, our previous knowledge of it was exceedingly meagre.

When we consider the enormous extent of British India, and its proportion to the area of the British Islands, the relative periods occupied on the two great national surveys, it cannot be wondered at that there is still a great deal to be done in the former country, where the first commencement was made during the earliest part of the present century. Fresh conquests of late years have added areas larger than our own islands, all requiring to be provided for, before even the older provinces could be got through. As an instance, it may be mentioned that the Nagpore and Nerbudda districts in Central India, recently formed into a separate agency or chief commissionership, under the designation of the Central Provinces, aggregate an area of very nearly 115,000 square miles, about equal to the whole of the British Islands.

The same staff that served with Captain Montgomerie, in the arduous survey already alluded to of the mountainous northern frontier, are now employed in extending the topographical survey of the Himalayas in British Ghurwal and Kumaon, eastwards as far as the Nipal frontier, where it is feared these most interesting operations must come to a stoppage, unless the inherent jealousy of the Nipalese can be overcome in the interests of science, which is more than doubtful.

The northern portion of the Punjab (comprising Hazara, Jhelum, and Rawul Pindi, districts subtending the Indus River, which are all of a very intricate and hilly character) has been laid down in a very masterly manner, and the 1-inch lithographed sheets are perhaps as fine specimens of the delineation of difficult ground and topographical drawing as can be met with in any country.

The Native States of Rajpootana in Central India, the Tributary Gurjat States of Orissa with Bustar, Chinna-Kimedy, &c., the Southwest Frontier Agency in Chota-Nagpore, the Godavery Talooks and assigned Districts of East and West Berar, ceded by the Nizam of Hyderabad, together with Pegu, are all now in good progress, and being prosecuted as rapidly as local circumstances will allow; but



an enormous area in these several localities still remains to try the endurance and ingenuity of the surveyors.

The Nizam's dominions of Hyderabad have just been completed, and the whole of the Madras or Southern Peninsula was depicted many years ago by the Madras Military Institution surveyors on the 1-inch scale. On this survey those sheets of the Indian Atlas were published. With the lapse of time, change of appearance of the country, the introduction of roads, railways, &c., and the enhanced value of the land, a second survey became a necessity, and this now in progress, will, it is hoped, be the means of enabling the Geographer for India to supersede all the old sheets, which may be more or less obsolete, with new ones.

Of the Bombay Presidency there is a great want of good topographical maps, especially of the northern portion, about Baroda, Surat, Ahmedabad, Goozrat, and Cutch. The regular survey in this Presidency was unfortunately stopped several years ago, and until very lately it has never been carried on again. For the sake of the Atlas of India it is to be hoped that nothing may again interrupt the regular course of the operations.

The Indian Atlas comprises, according to the Index Map issued under the authority of the late Court of Directors of the East India Company, 177 proposed sheets or sections. Each sheet measures  $40\frac{1}{2}$  by  $27\frac{1}{2}$  inches, or nearly  $2\frac{1}{4}$  degrees of longitude, and  $1\frac{1}{4}$  degree of latitude, and embraces an area of 17,824 square miles, and is engraved in England on the  $\frac{1}{4}$ -inch scale. Of these sheets, up to the present date,  $78\frac{1}{4}$  sheets have been published.

Printed progress reports illustrative of the whole of the operations in India up to the present season, and Index Maps, showing the state of the Atlas, have been deposited in the Society's library by the Surveyor-General of India, together with copies of such miscellaneous and general maps, lithographed in Calcutta, in anticipation of the publication of the engraved sheets of the Atlas as were deemed likely to be useful and interesting.

*Chinchona Cultivation in British India.*—In a previous Address I dwelt upon the valuable service rendered to the natives, colonists, and soldiers of our great Indian possessions by the labours of our accomplished Secretary and enterprising traveller, Mr. Clements Markham, who was the first to introduce the cultivation of the best species of Chinchona-plants, collected in the Andes of Peru and Ecuador, into India. As the Secretary of State for India deemed it to be essential to ascertain the progress made in the

growth of these plants in their new habitats, he sent Mr. Markham last winter to make the inquiry, and in consequence the public are now furnished with a clear and most satisfactory Report, which I consider to be one of great national importance.

Chinchona cultivation was introduced into India in 1861, by Mr. Markham,\* and already, in February of this year, there were 984,143 plants flourishing in the Government plantations on the Neilgherry Hills alone; while the cultivation had been undertaken by numerous planters and private companies. The tallest trees were found to have reached the height of 17 feet, and an unlimited supply of seeds will have been obtained from them this year. The Government plantations on the Neilgherries, when completed, will cover 2200 acres. There are other Chinchona plantations in Ceylon, at Darjeeling, at Kangra in the Punjab, and at Mahabaleshwur, near Bombay.

Two of the measures necessary for the success of this great undertaking have been crowned with complete success, namely, the introduction of the most valuable species of Chinchonæ from the South American forests into India, and their conversion from wild into cultivated plants. The latter measure has been so successful that, whereas the largest yield of febrifuge alkaloids in Peruvian bark imported from South America is from 3 to 5 per cent., the bark grown in India, though only three years old, has already given the unprecedented result of 11 per cent.! This remarkable success in the cultivation is mainly due, as Mr. Markham tells us, to the great skill and ability of Mr. McIvor, Superintendent of the plantations, who was elected a Fellow of the Royal Geographical Society during the present session.†

The points which remained for decision, connected with the Chinchona enterprise, were the best means of utilising the bark with a view to the spread of its beneficial effects amongst the millions who suffer from fever in India, and who cannot afford to buy quinine at 20s. per oz.; and the extension of the cultivation to as many different districts as possible.

Mr. Markham was called upon specially to report upon these

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\* The Secretary for India who employed Mr. Markham to collect the plants in Peru and transport them to India, was Lord Stanley; and it was his successor, Sir Charles Wood, now Viscount Halifax, who sent him to examine and report upon the progress made since the transplantation took place.

† I may add that Dr. Cleghorn, Conservator of the Madras Forests, and who accompanied Mr. Markham in Southern India, has also become a Fellow of this Society. Dr. Cleghorn is, I am told, one of the few men who have penetrated into the Anamallay Mountains, and explored their almost unknown plateaux and forest-covered slopes.

points. Now, with regard to the first of them, he has tried several experiments with the bark on the Neilgherries, and has strongly urged the establishment of manufactories for the production of the febrifuge in so cheap, and at the same time so efficacious, a form, as to place it within the reach of the poorest ryot in India and his family. He has also recommended the employment of an eminent Dutch chemist, Dr. de Vry, as chemical reporter on the Peruvian barks grown in India. As to the second point, he explored the little-known hills of Travancore, examined the capabilities of the Pulney Hills, of the wild and beautiful Koondah range, and of the coffee district of Wynaad. He went over the Travancore Hills, through dense forests and over plains covered with elephant-grass 10 feet high, on foot; crossing the great River Peryaur on a rude bamboo-raft. The result of these journeys has been that he has succeeded in promoting the cultivation of Chinchona-plants in the Travancore State, on the Pulney Hills, and by numerous planters in Wynaad.

Mr. Markham's great object is to see Chinchona-trees growing near each hut, in every village in the hill districts; so that the cure for the terrible scourge which now decimates the people may be at their doors, and that a decoction of Peruvian bark, at least, may be immediately procurable when the feverish season comes on. Although, in his highly satisfactory Report, Mr. Markham has not touched on the commercial aspect of the question, he thinks that Chinchona-bark will ere long form an important item in the list of Indian exports, and be another source of wealth to our Eastern Empire. In the mean time, I entirely agree with my sagacious friend Mr. John Crawford, whose authority on Indian affairs stands so high, that the thanks of the country are due to Mr. Markham for the great and beneficent achievement of the naturalization of Peruvian bark in India.\*

*Japan*.—Although the coasts of the Japanese archipelago have been in part well laid down both by native Japanese cartographers and our own naval surveyors, our knowledge is still very scanty regarding the varied interior of these islands; it was therefore with great satisfaction that I listened to a paper by Commander Forbes, at our last meeting, describing two excursions which he had recently made into the interior of Yesso. Besides a sketch of the volcanic district on the shores of this island, and especially along the western side of

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\* See the 'Examiner,' May, 12th, 1866. Sir W. Denison, the able ex-Governor of Madras, has also expressed this opinion. See 'Proceedings,' 11th June.

Volcano Bay, he gave us an interesting account of the Ainos, or race of hairy people, who still occupy the whole of the interior, and whose appearance and habits he had opportunities of observing. In the discussion which followed the reading of this paper, Professor Huxley gave us a most clear and striking account of the peculiarities of a skull of this curious people which Commander Forbes had brought home, and showed that, in its elongated shape, it differed essentially from the round forms of the Mongolian and other nations of Eastern Continental Asia, and showed affinities with the Esquimaux type. It is a singular circumstance that the Japanese offer the same peculiarity in form of skull, and Professor Huxley attributed this to their having commingled with the Ainos during past centuries.

AUSTRALIA.—In the general sketch of the progress of discovery and colonisation in the great British Terra Australis which I presented to you last year, little was said of the existing state of Queensland, for in truth such important advances were then being made, under the enlightened government of Sir G. Bowen, that I deferred enlarging upon the subject until the whole of the materials were before me.

Measured from its southern boundary, near Brisbane, the capital, to Cape York, the extreme northern point of the continent, the colony of Queensland has a length of 1100 geographical miles, and an average width of not less than 500 miles.

The region around Brisbane, formerly the Moreton Bay Settlement of New South Wales, had long been known as a healthful and thriving tract, but, in the absence of experience, few persons had anticipated that the greater part of the lands lying to the north of it, and ranging into inter-tropical latitudes, would be found suitable for Europeans, and still less that such lands would prove to be highly profitable grazing-grounds, where sheep as well as cattle could thrive and multiply, even up to 18° south of the equator. We have no longer to speculate upon hypotheses, and I have only to use the emphatic language of Sir George Bowen, when he last addressed the House of Assembly of that colony, to bring to your mind's eye what the rapid and at the same time solid progress of this colony has been :—

“Since the establishment of Queensland, in December, 1859,” says the Governor, “our European population has increased from less than 25,000 to nearly 90,000 ;—that is, it has been augmented nearly fourfold ; while our revenue, and our trade (including

imports and exports) have been more than trebled. The other chief elements of material prosperity have advanced in almost equal proportion. During the same short period, cotton, sugar, and tobacco have been added to our list of staple products; a line of new ports has been opened along our eastern seaboard from Keppel Bay to Cape York—a distance of a thousand miles; while pastoral occupation has spread over an additional area, at least four times larger than the area of the United Kingdom. In 1859, our settlers had hardly advanced beyond the Darling Downs to the west, or beyond Rockhampton to the north. Now, in 1865, there are stations seven hundred miles to the west of Brisbane, and eight hundred miles to the north of Rockhampton. These facts, derived from the official statistics, cannot fail to be interesting and instructive to our fellow-countrymen at home: while they must be to you, as they are to me, a subject of honest pride, and of devout thankfulness."

The progress of discovery in the unexplored tracts of this prosperous colony has been so rapid of late years, that it is difficult to keep pace with the strides which have been made. Amongst the most important of the expeditions which have led to the increase of our knowledge of the country, I may particularly mention that of the Messrs. Jardine, who in endeavouring to open up a route for the transport of cattle from the pastoral districts of Southern Queensland to the new settlement at Cape York, traversed the whole of the previously unknown western portion of the great North-Eastern Peninsula of Australia. The journey of Mr. J. G. Macdonald must also be recorded as one of the remarkable events in the progress of discovery in this part of the continent; this traveller having, in the latter part of 1864, crossed from Port Denison to the Albert and Nicholson Rivers, and returned by nearly the same route, after exploring a large extent of new country. The narratives of both these expeditions will be published in the next volume of our Journal; and I may also refer you to the volume recently published for an account of another successful exploration which seems likely to lead to results of great practical importance: I mean the discovery by Mr. J. E. Dalrymple of a route between Rockingham Bay, over the precipitous coast range, and the pastoral country of the Valley of Lagoons, by which the produce of the extensive table-lands of the interior will find an easy outlet to the seaboard. The journal of Mr. Dalrymple, already known for his previous geographical exploits in Northern Queens-

land, in company with Mr. A. J. Scott,\* gives a vivid picture of the physical features of the Rockingham Bay District.

In sending home an able memorandum, prepared at his request by Mr. W. E. Lamb, respecting the last settled country at the head of the Gulf of Carpentaria, Sir George Bowen adverts to its details as proving the unprecedented rapidity with which pastoral occupation has advanced in northern Queensland during the last few years, thus giving a distinct contradiction to those persons who, judging from the condition of countries on similar parallels north of the equator, had inferred that sheep never could flourish or produce valuable wool in such inter-tropical latitudes. On former occasions I have endeavoured to check this incredulity by reference to what I considered to be good evidences of the capability of successful sheep-farming as derived from the experience of Landsborough and M'Kinlay, and, indeed, from all the bold explorers who understand the subject. We are now told by the Governor, that sheep-farming has spread, within the last four years, over an additional area equal to that of France, and that sheep are now successfully depastured as far north as  $18^{\circ}$  s. lat., both at the head of the Gulf of Carpentaria, and also towards the eastern seaboard of the colony, upon the elevated plateau above Cardwell, the new township in Rockingham Bay, named after the vigilant Minister of the Colonies. And here it must be recollected that a large portion of this northern territory of Queensland consists of basaltic table-lands, having an altitude of from 1000 to 3000 feet above the sea, and therefore enjoying, during several months of the year, a comparatively cool climate. Indeed, Sir George Bowen estimates that at this time (January 1866) there are feeding in the extreme northern pastoral district of Burke alone (full accounts of which have recently been given in our 'Proceedings') at least 110,000 sheep and 12,000 head of horned cattle. At the new Port of Burketown, on the River Albert, there were some 300 inhabitants when he wrote (Jan. 18th), destined, doubtless, to be the founders of a great mart of commerce, and an entrepôt between our Indian and the mass of our Australian settlements, through the grand indentation of the Gulf of Carpentaria, which penetrates 500 miles into the continent. Again, at the eastern point of this grand bay, the new settlement of Somerset, near Cape York, in  $11^{\circ}$  s. lat., so well described in our 'Proceedings' by Mr. John Jardine, has been a complete success; and the Europeans who have now been there for

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\* See 'Proceedings,' vol. viii. p. 110.

nearly two years, find the climate so agreeable and healthy that Mr. Jardine is of opinion that it may become a sanatorium for invalids from our establishments in India and China. The new port is already much resorted to by ships passing through Torres Straits, and hence there is every prospect that Cape York may one day be to Australia what Singapore is to our Indian Empire and the great Eastern Archipelago.

But to return to the consideration of the great region lying immediately to the south of the Gulf of Carpentaria. We now have in the report of the Crown Commissioner, and on the authority of Sir G. Bowen, the most reliable evidence that this country is eminently adapted for stock of all sorts. Besides the richest grasses, there are many plants on which sheep and oxen thrive, such as "salt-bush" and "native leeks, carrots, and cucumbers;" whilst it is believed that in no part of the region to the north of the 19th or 20th degree of latitude do those droughts prevail, which have proved so prejudicial in other and more southern portions of the mainland of Australia. With nights invariably cool, and with much moisture retained in wooded and richly-grassed extensive plateau lands, the heat is necessarily modified; the average temperature in lat. 20° being 74° Fahr. There can indeed be no difficulty, as I have said in former addresses, in explaining why the isothermal lines of Northern Australia should differ much from those which pass from east to west in similar latitudes to the north of the Equator, where no such terrestrial conditions exist, and where rocky and sandy soils, in great part, at no great elevation above the sea form a peninsula in the midst of a hot Indian ocean. This evidence exists indeed in Australia itself, for the new settlement of Somerset at Cape York, in 11° s. lat., jutting out into a warm sea, is just as unsuitable for sheep as the same parallel n. of the Equator in southern India.

To satisfy you as to the wonderful progress of these newly inhabited parts of Queensland, I may refer you to the February number of our 'Proceedings,' in which we learn from Mr. Landsborough that Bowen, the town of Port Denison which arose in 1861, had reached in four years a population of 1000 persons, and that Rockhampton, on the Fitzroy River, had risen in eight years to a population of 5000 to 6000 inhabitants.

When, however, we turn from Queensland, that highly flourishing north-eastern colony of Australia, and look to the results of the efforts which have been made to found settlements on the northern

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coast, I am compelled to acknowledge that there is little or nothing to encourage the hope that the extreme northern shores of that coast will ever be found to be suited for the colonisation of European settlers. Indeed, I never anticipated a successful result from the bold endeavours made by the South Australians to form a settlement at the ultimate point of the explorations of McDouall Stuart, which terminated in a seaboard of low altitude, and within 12° of the Equator. I was, therefore, quite prepared to learn that such an enterprise would prove a failure, which I fear it is, if I rightly judge from the lively and well-written description of Mr. Stow, who, with his companions, faced and surmounted all the dangers of an open-boat voyage of 1600 miles along the whole of the northern coast, to escape from that port and reach the settled colonies on the West, rather than remain in so ill-selected a spot.\*

From that narrative we also learn that, considering the numberless reefs and islets which stud that northern shore, and the vast low swamps and jungles extending over a considerable portion of the mainland, no one can anticipate the successful formation of British settlements. Even when the explorers in their bold boat-voyage reached Camden Bay, already a settlement, and with a certain amount of elevated and high land behind it, they found much distress among the settlers, and sheep perishing from the heat of the climate.

Although these discouraging accounts have been received from the new settlement in the northern territory, it must be recorded, in justice to the Government of South Australia, that they have now taken all the necessary steps to ensure a complete survey of the country around Adam Bay, and learn its capabilities. In September last, as I am informed by our associate Mr. F. S. Dutton, an expedition was despatched, under the command of the well-known explorer McKinlay, with forty horses and a suitable complement of thorough bushmen, and with instructions to explore the whole country south of Adam Bay, between the Victoria River and the Gulf of Carpentaria. Since then a map has been received of the Adam Bay district, in which, on a scale of 1 inch to 2 miles, the nature of the country is laid down, as surveyed by Messrs. Auld and Litchfield, Government Surveyors.

I must here, however, remind my associates that the only locality which I have for many years advocated, as by far the best adapted for any settlement approaching to the northern shores, has been overlooked in all the last efforts to form such settlements. That which

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\* 'Proceedings,' Feb. 20, 1866.



the extensive Gulf of Carpentaria effects upon a large scale, by forming a southern indentation into the Australian Continent for 500 miles is effected on a smaller scale by the more circumscribed Cambridge Gulf, especially towards the south-eastern extremity, or the Queen's Channel. There, in a sheltered position, with fine adjacent plateau lands, an abundant vegetation, and at the mouth of the northern River Victoria, Mr. A. Gregory planted a station in the year 1859, and thence he made his famous journey across to the present Queensland. Mr. Wilson, who was left in charge of the Camp, and who remained there for ten months, gave us a most satisfactory account of the climate and productions of the district. When we reflect that this locality is at least three degrees of latitude further removed from the Equator and the Indian Ocean than the new settlement of the South Australians at the mouth of the Adelaide River, and is backed by lofty and productive lands, we may reasonably anticipate that, with the extension of colonisation westward from the shores of the Gulf of Carpentaria, the time is not distant when the fine deep bays at the head of Cambridge Gulf will also, like the Gulf of Carpentaria, become the resorts of British commerce. Again, such land-locked waters, midway along the northern shore, and contrasting strongly with the exposed flats of Adam Bay Settlement, will serve as harbours of refuge for our mercantile marine, and be, as I urged when occupying this chair many years ago, of real service to the nation in case of a maritime war as a station for fleets destined to protect our Eastern commerce. I now, therefore, renew the gratification I experienced in the year 1857, when I heard the then Minister of Her Majesty's Colonies, now Lord Taunton, say, on receiving our Founder's medal for Mr. Gregory, that after the description of the soil and climate at the mouth of the Victoria, "it was no extravagant supposition that some of us may live to hear of that hitherto unknown region becoming the home of a prosperous British settlement." Such I am persuaded would already have been the issue, if the colonists of South Australia had chosen the Queen's Channel of the Cambridge Gulf as the seat of their bold enterprise, instead of the extreme northern and exposed situation of Adam Bay, to which McDouall Stuart had so boldly advanced.\*

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\* Since this address was read, and whilst these pages are being prepared for the press, I learn that the distinguished Australian surveyor John McDouall Stuart died on the 5th of June, at Notting-hill. I have in former Addresses so highly eulogised the labours of this adventurous explorer, that I may refer my readers to them as a record of his successful career as a traveller, and as a tribute to his memory.

I cannot quit the subject of Australia without again alluding to the laudable and strenuous exertions which the inhabitants, and particularly the ladies of Victoria, led on by our gifted associate Dr. Mueller, have been and are making to discover the line of Leichhardt's route in the interior. If this effort has not the good fortune to save any one of his party who may have survived, it may at all events determine the fate of the great explorer. Animated by the example of the ladies of Australia, and seeing that the Colonial Legislatures of Victoria, South Australia and Queensland had subscribed 1500*l.* towards this expedition, which must assuredly have important geographical as well as pastoral results, I had much pleasure in proposing that our Council should grant 200*l.* towards this object. It was, indeed, most gratifying to me to know that the Queen headed this subscription with a donation of 100*l.*, whilst Mr. Cardwell, Her Majesty's Minister of the Colonies, handsomely united with us in augmenting the fund. The very announcement of this subscription will, I hope, convince the Australian colonists of the deep interest which is taken in their welfare by their Sovereign and the mother country. Unhappily, the unprecedented drought of the past season was fatal to most of the horses of the expedition under Mr. McIntyre ;\* but we may rest assured that Dr. Mueller and his associates will be reinvigorated in their spirited exertions, by the proofs of the interest taken in the successful issue of this stirring enterprise by their Sovereign and their friends in England.

*SOUTH AMERICA.*—The exploration of the River Purùs, one of the most important branches of the Amazons, for nearly 1900 miles, and the determination, for the first time, of its true course throughout that long distance by a series of astronomical observations by Mr. Chandless, for which the Council has conferred upon him the Patron's Medal, was undertaken voluntarily, and at his own expense, with the object of determining a question not only of great geographical interest, but of the first importance to the inhabitants of the countries situated between the Eastern slopes of the Andes and the Amazons ; namely, whether or not a direct communication exists which may be made available by this river, as has been long supposed, between those countries and the Atlantic.

All we knew till recently of the Purùs was, that it is a river of the first magnitude, discharging itself into the Amazons by four

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\* By the last account the expedition had reached a well-watered country, and were proceeding steadily to the west.

mouths, one of which is described as more than half a mile in width, and 18 or 20 fathoms in depth at a mile from its mouth, and supposed to have its origin at no great distance from Cuzco in Peru, where the greatest want of the inhabitants is such a means of intercommunication with the rest of the world, and an outlet for their valuable products and mineral wealth without the enormous cost and difficulty of transporting them over the Andes for shipment; but neither under the Governments of the Sovereigns of Spain or Portugal, nor their successors, has any one been known to have descended the Purús from Peru, to verify its capabilities. Fear of the savage tribes who live upon its upper affluents has hitherto effectually barred their examination.

The general course of the river, as shown upon our maps, was originally laid down from information collected from the Indians in the time of the Spanish rule by the missionaries, whose well-known labours in these regions entitle them to all praise. The best delineation of it, upon their authority, is that given in the great map of South America by Don Juan de la Cruz, in which it appears as originating near the mountain ranges of Paucartambo, and at no great distance from Cuzco; and this was corroborated by later accounts, and especially by those obtained by Don Taddeo Haënke at the close of the last century, whilst exploring the Beni and other affluents of the great river Madeira, as may be seen in his interesting memoir upon those rivers in the fifth volume of our Journal.

We knew little more of the Purús till our indefatigable Secretary Mr. Markham, in the course of his travels in the department of Cuzco, undertook a journey from Paucartambo with the express object of determining, if possible, its true sources. Following the course of the Tono, he penetrated the dense forest through which it runs, and after a tedious and difficult passage reached a hill from which he obtained a view of a great river running eastward, which, from all the accounts given him, he felt satisfied could be no other than the Purús. He described it as a mighty stream, there called the Madre de Dios, or Amaru-mayu, and said to be increased, 100 miles beyond, by two great rivers, the Araza or Maracapata, and the Ynamberi. The point where he saw it he fixed in lat.  $12^{\circ} 45'$ , long. about  $70^{\circ} 30'$  w. There was, no doubt, ample ground for such a belief, but it must be admitted there was no certainty regarding the information so collected. No one had ever been down those rivers, and the only point positively determined was the position of a mighty stream, where Mr. Markham saw it, running in the direction of the

reported course of the Purús, which it was supposed, from all accounts, would be found to be the main source of that river.

In the mean time, however, the same uncertainty no longer existed with regard to the lower parts of the Purús, which had become more or less known from its being resorted to at certain seasons by traders from the Amazons in quest of turtle, and the sarsaparilla, copaiva, and India-rubber found in the forests through which it flows. Their reports of the possibility of ascending it for several hundred miles induced the Brazilian Government to send exploring parties up it, in the hope of opening a communication between its higher waters and the Bolivian settlements above the falls of the Madeira; but those expeditions led to no other results than to confirm the previous report of there being no serious impediment to the ascent of the river for upwards of 1200 miles.

Mr. Spruce, who has passed so many years in the regions bordering on the Amazons, obtained the diary of the commander of one of these expeditions, one Serafim Salgado, which he translated as a note to Mr. Markham's '*Cieza de Leon*,' a volume printed for the Hakluyt Society. It took that party four months in two canoes to reach the mouth of the River Aquiri, the principal affluent of the Purús from the south, near which they were met by a party of the Canamary Indians, whom Serafim describes as cannibals, preparing to kill and rob them. This imaginary danger escaped, they proceeded some days higher up the river, when Serafim says it was impossible to go on, the river having become so narrow and obstructed that it did not admit of the passage of even the smallest canoe.

Mr. Chandless (who could not have seen Serafim's paper) has shown both these statements to be singularly incorrect. He describes the Canamaris as the most honest and civil of all the Indian tribes he fell in with; and as to the navigation beyond being impossible, he went up the river 600 miles further, sufficiently proving how little such information is to be trusted.

Mr. Chandless's diary of his own Expedition, which was read at the meeting of the Society on the 26th of February, will appear in the next volume of our Journal. The result will disappoint the hopes entertained of this river being available as an outlet for the produce of the eastern provinces of Peru. It sets at rest also all question as to the Madre de Dios being the Purús, Mr. Chandless having traced the latter throughout its long and tortuous course, for nearly 1900 miles, to its origin in insignificant streams, *two degrees to the north of the Madre de Dios*, where seen by Mr. Markham.

The question for us geographers then arises, What becomes of the Madre de Dios? Mr. Chandless inclines to think it may be one of the sources of the *Beni* which falls into the Madeira; if so, may it not be the Tuchi, described by Haënke (in the paper I have previously alluded to) as the farthest west of the affluents of the Beni, and laid down on the map accompanying his paper as joining the Beni in nearly the same parallel in which the Madre de Dios was seen by Mr. Markham running eastward. Moreover, I find, upon reference to De la Cruz's map, that the *Amaru-mayu*, which Mr. Markham gives as one of the names of the Madre de Dios, really does appear as one of the names of the *Beni* in that map. (See also D'Anville, whom De la Cruz quotes as an authority.)

On the other hand, the *Yunaberi*, which Mr. Markham was told fell into the Madre de Dios below where he saw it, is shown on the same map to run in a north-easterly, instead of westerly direction, and to form one of the principal branches of the Ucayali. But to which of these river systems, that of the Beni or of the Ucayali, the Madre de Dios really belongs, must now, I fear, remain in doubt, till some adventurous pioneer is bold enough to launch a boat upon the Madre de Dios, and risk his life among the savage Chunchu Indians, to settle the question.

I am happy to say that we have recently learnt that Mr. Chandless has safely returned down the Purús from his second voyage up it—the object of which was to explore the Aquiry, its main branch from the southward, which he was unable to examine on his first trip,—and that he may be shortly expected in this country with the details, which will then complete our knowledge of the Purús.

If, with the valuable aid of Sir Woodbine Parish, I have been thus diffuse, it is because this question is one in which South Americans take as deep an interest as the search for the sources of the Nile creates amongst geographers in our own hemisphere.

*United States of Columbia.*—I mentioned in my Address last year that His Excellency General Mosquera, who has been since chosen, for the third time, President of the United States of Columbia, was engaged upon a work on those countries. It has since been completed, and under the title of 'Compendio de Geografia General de los Estados de Columbia,' may be well called a complete Handbook, on the very best authority, of the countries it describes, and is highly creditable to the Gran-General, who, notwithstanding his many important duties has found time to compile such a mass of

interesting information. It is accompanied by an atlas of maps, corrected from the surveys of Codazzi and others, under the General's special directions.

*Topographical Survey of Buenos Ayres.*—From Buenos Ayres we have received from our Corresponding Member, Don Saturnino Salas, President of the Topographical Department of the Argentine Republic, the remaining sheets of the great survey of the Province of Buenos Ayres, recently completed by the officers of that department, and to which I must call attention, as showing the remarkable extension of those agricultural and pastoral establishments which promise to make it the most flourishing and important of all the South American republics; whilst steam and railroads, chiefly promoted by British enterprise, are doing their work in developing the resources of the interior, which, till a few years ago, was an inaccessible and uncultivated waste. The numerous names of our countrymen which appear upon the map amongst the landed proprietors, show how large an interest British capitalists have acquired in that part of the world.

*NORTH POLAR EXPEDITION.—Greenland.*—After the great zeal which was manifested last year by the Council of our Society, and by numerous Arctic explorers of eminence, in favour of a searching expedition to determine the true condition of the region around the North Pole, it is mortifying to be under the necessity of stating that there is at present no prospect that such an enterprise will be undertaken. Every person experienced in Arctic voyages being of opinion that a well-found Government expedition alone could succeed (private enterprise being out of the question), the Royal Geographical Society took the lead in pressing upon Her Majesty's Government the desirability of completing those Arctic researches which had already so distinguished our country. Unfortunately, as we think, the Admiralty have been unwilling to listen to our appeal, though it was backed by the opinions of the Royal Society and all the Scientific Societies of the Metropolis, as well as by the Imperial Academy of St. Petersburg, and other foreign scientific Bodies in Europe and America. Nor has the project so creditably and energetically taken up by the Geographers of Germany, headed by Dr. Petermann, had a more favourable issue; the present unsettled and warlike state of that great country being hostile to any such enterprise.

In the mean time, and while hoping for a change in the opinions on this point only of those who so ably direct our naval affairs, I

must direct your attention to a project to explore the northern coast-line and interior of Greenland, which seems to me to call for your hearty good wishes. One of our younger associates, Mr. Edward Whymper, already distinguished by his courage and self-reliance in surmounting the highest peaks of the Alps, has conceived the bold project of penetrating along the surface of some of its glaciers into the interior of this snow-clad continent, being convinced, from the number of deer which sometimes find their way to the coast, that there are, here and there, well-grassed valleys and recesses. He also believes it possible to trace by land the extent of Greenland to the north, which you will recollect was one of the main geographical objects of our projected North Polar expedition. On application to our honoured associate Admiral Irminger, to provide Mr. Whymper with a suitable companion, I am happy to say that a well-trained Danish guide is ready at Copenhagen to join our traveller, who is determined to make a preliminary trip to Greenland next spring, and afterwards to endeavour to accomplish what no one before has ever thought of. This is truly the *ne plus ultra* of British Geographical adventure on the part of an individual!

AFRICA.—In a postscript to the last Address I had the gratification of announcing the arrival at Khartum of Mr. Samuel White Baker, after the completion of those arduous and extensive journeys in which he discovered that second great water-basin of the Nile to which he assigned the name of “Albert Nyanza.” Nothing which has happened since the foundation of this Society gave me greater satisfaction than that this devoted and high-minded traveller should have thus proved himself to be truly worthy of the medal which had previously been given to him, and received by his brother at a time when, indeed, we were not certain of ever seeing Mr. Baker again! But as we decerned our highest honour to him for the chivalrous spirit he had displayed in rushing to the rescue of Speke and Grant, and for that gallant endeavour—whatever might be the result—to complete the first outline survey of Central Equatorial Africa, so I naturally rejoiced the more when his efforts were crowned with such triumphant success. Since that time we have had from Mr. Baker himself an eloquent and vivid sketch of his explorations and of the difficulties which he and his devoted wife had gone through during their five years of pilgrimage; and referring you to our ‘Proceedings’ for an outline of his discoveries, I have now to announce the issue of his work, in two volumes, entitled ‘The Albert Nyanza, Great Basin of the Nile.’ This work, written

in an unaffected, clear, and vigorous style, and illustrated by singularly telling sketches, will, I doubt not, rivet the public attention, and be most widely circulated. I will now only advert to two of the many results of his intrepid and persevering researches. First, the verification of the accuracy of the positions determined by the astronomical observations of his lamented precursor, which is of vast importance, for it has blown to the winds the rival claims of others, and has proved the truthfulness of the data established by Speke.\* Next, the realization of the existence and definition of the vast water-basin of the Luta Nzige, sketched out from native information by Speke; an event of the highest importance in the annals of African scientific research.

It is true that, in the days of Ptolemy, the Nile was described as flowing from two lakes, and afterwards, in the middle ages, it was so placed upon old maps; but, irrespective of these bodies of water being most erroneously laid down as to latitude (*i. e.* many degrees south of the equator), their true relations to each other and to the Nile were wholly unknown, for neither of them had ever been visited by an European. Any knowledge respecting them must, therefore, have been obtained from the natives or Arab merchants. In the old maps I refer to,† the two lakes are represented as being perfectly unconnected, each sending off long independent streams, which afterwards, and far to the north, unite and then form the Nile. Our modern British discoverers have shown that the Victoria Nyanza of Speke, lying at an altitude of 3740 feet above the sea, is united with the Albert Lake by discharging its surplus waters into that grand lower basin, which Baker has found to attain an altitude of 2720 feet only and therefore to lie 1020 feet below the upper lake, or Victoria Nyanza of Speke and Grant. On former occasions I have directed your special attention to the striking phenomenon of the long system of water-basins, lakes, and rivers flowing therefrom which prevails in the elevated plateau-ground of Central Africa. Many of these bodies of water lie, so far as we know, in shallow depressions, the

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\* I rejoice to announce that the obelisk for which many of us have subscribed, to be erected to the memory of the lamented Speke, will, by permission of the Queen, be shortly erected in one of the principal walks of Kensington Gardens.

† Maps in the library of the College "de Propaganda Fide" in Rome; also maps re-published by the late Mr. Hudson Gurney. See also this subject illustrated by our associate Mr. John Hogg, in his interesting treatise "On some old maps of Africa, in which the central Equatorial Lakes are laid down nearly in their true positions," published in the Transactions of the Royal Society of Literature, 1864.



edges of which extend into marshy lands. Now, the Albert Nyanza of Baker is a striking contrast to all such lakes; for this enormous body of water, estimated to be about as long as Scotland, is a deep excavation in hard granitic and other crystalline rocks. Looking to the simplicity and antiquity of the geological structure of Central Africa—as spoken of in my previous Addresses \*—it is this result of the exploration of Mr. Baker, or this profound excavation in hard rock, which has most interested me, and must, I am sure, interest all my brother geologists as well as physical geographers. For, if this great depression in hard rocks be not due, as I think it is, either to natural conformation or to some of the great movements to which those rocks may have formerly been subjected, how else are we to account for its existence? I have previously shown, from the absence of all marine deposits of tertiary and detrital age, that Central Africa has not been submerged in any of those geological periods during which we have such visible and clear proofs of great subsidences, elevations, and denudations in other quarters of the globe. Hence we cannot look to the sea as a denuding power in Central Africa. Still more impossible is it to seek in the existence of former glaciers an excavative power; for here, under the equator, not only can no such phenomena have occurred, but even if the application of such a theory were possible, it would be set aside by the fact of the entire absence, in Central Africa, of any of those moraines or transported débris which are the invariable accompaniments of glaciers, or the erratic blocks transported by former icebergs.

The discoveries, therefore, of Mr. Baker, which show that the vast lake of Albert Nyanza lies in a deep hollow subtended by mountains of hornblendic gneiss, quartz and porphyry, is an admirable datum for geologists to rely upon, who, whether looking to the physical geography and outlines of Central Africa, or to its extremely simple geological structure, are fairly enabled to refer this great variation of outline either to the original devious evolutions of great masses of molten matter, or to some great ancient movements of dislocation among very ancient metamorphic strata. In short, Central Africa presents no existing denuding agent which, if it operated for millions of years, could have excavated the enormous hollow in which the great Albert Nyanza lies.

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\* See the Addresses of 1852, p. cxxii; of 1857, p. clxvii; of 1858, p. ccviii; of 1859, p. clxxix; of 1863, p. clxxii; and particularly the Address of 1864, p. clxxxv, in which the geological as well as physical structure of Central Africa is sketched out.

Turning from Central Equatorial Africa to the West Coast, I again advert with pleasure to the zealous endeavours of M. du Chaillu, on which I spoke last year, to reach Central Africa from his old station near the mouth of the Fernand Vaz. Alas! you have now heard from himself how, by an untoward accident, he was prevented from reaching the heart of the loftier and higher mountains into which he was penetrating, making by the way numerous astronomical observations and photographing, as he went along, the scenery and costumes of the people. Correcting the outlines of his first map of these regions, which he had rapidly constructed without any real survey, he made his bold and highly adventurous journey into the interior, accompanied by a few faithful coast natives only. From Olenda in the Ashira country, which he visited on his former journey, he made an excursion northward to the Samba Nagoshi Falls, the correct position of which he has thereby determined, and afterwards diverging from his former route, he continued his journey eastward, and reached the village of Mooao Komba, 440 miles distant by his line of march from the western coast. I feel convinced that but for the unlucky accident which caused the natives to rise upon him he would have realised those expectations to which I gave expression at our last Anniversary.

When his whole narrative is published (including a vivid picture of his disasters and escape), I am sure the public will see in it the evidences of much patient research and lively observation; indeed, I know that the points in natural history which he announced, after his former journey, as original, but which were discredited by some persons, have been confirmed by Professor Owen and others, who have since examined actual specimens of the very animals the existence or nature of which had been doubted.

It therefore gave me great satisfaction when the Council adjudicated to M. du Chaillu a sum of money not merely to compensate him for the loss of instruments, which he had provided at his own cost, but as a testimonial of their approval of the energy and fidelity with which he had endeavoured to realise his bold and gigantic project. In the mean time, through his very numerous astronomical observations, he has fixed many positions over a tract of country previously unknown, which we may designate as "Du Chaillu's Land."

Northward of Du Chaillu's route another traveller, Mr. R. B. N Walker, is now endeavouring to penetrate into the interior, under

the auspices of our Society. After a long delay on the coast, he proceeded on his journey in December last with supplies which will enable him to remain a year in the interior. His object is to reach, if possible, a large lake, or chain of lakes, reported to exist about 500 miles east of the Gaboon.

Some years ago much interest was excited in the travels of a Hungarian gentleman, M. Ladislaus Magyar, who announced, in letters published in Hungary and in Petermann's '*Mittheilungen*,' that he had penetrated into the interior of Africa from Benguela as far as 27° E. longitude, and a brief account of his explorations was published in the 24th volume of our Journal. My attention has recently been drawn by his accomplished countryman, Dr. Rónay, to the published work of this traveller, the first volume of which appeared in 1859 at Pesth, in the Hungarian language, under the editorship of M. Hunfalvy János. This volume comprises only the early portion of his travels, between the coast and 19° E. longitude, during which the traveller married the daughter of the powerful chief of the Bihé country. In subsequent expeditions, the narrative of which was to have formed two other volumes, he advanced much further to the north-east and south-east, and visited previously unknown regions north and south of Livingstone's line of march in his famous journey between the Makololo country and Loanda. It is now more than five years since he sent home the manuscript of his first volume; and he then stated that it would be followed by the second, which at the time he wrote was nearly finished. Since then nothing more has been heard of him; and his friends having applied in vain to the Portuguese Government for information, it is feared that he has perished.

A comparison of the results of these explorations, as far as they have been published, with those of Dr. Livingstone has already been entered into by Dr. Petermann and other writers. My object in now introducing the subject is to record that Dr. Rónay, having given me an analysis of the first volume of these travels, states that although Ladislaus Magyar was very careful in giving the degrees of latitude and longitude and the elevations above the level of the sea, and says that he used instruments, he does not specify their nature. In so remarkable a series of journeys the absence of full information on these points is a great defect, especially as the first sketch of his travels, published, as I have before stated, in our Journal, was considered, by the able critical geographer, Mr. Cooley,

in the commentary appended to the paper, to be very doubtful as regards the geographical positions. The narrative, however, is full of interesting observations concerning the manners and political and religious institutions of the people, visited by a traveller who spoke their language and lived amongst them almost as a native.

Of the melancholy termination of the well-found expedition of the intrepid Baron C. von der Decken, from which so much was anticipated, notice has already been taken in treating of the career of that distinguished traveller, with whose death we must, I fear, abandon all hope of ever reaching Central Africa, or the countries watered by the Nile, by first passing through the Somaui countries and then through a region inhabited by the more savage Gallas.

With brighter hope I turn to the prospects of the sagacious and energetic Livingstone. Cordially received and supported at Bombay, he proceeded to Zanzibar, where he has the assistance of the Sultan, and from whence his expedition will be directed, as I announced last year, to the Rovuma River. After ascending that stream he will first determine the course of the waters between his own Lake Nyassa and the Tanganyika of Burton and Speke. Next, if he can reach the latter, and, after building a boat on it, is able to proceed to its northern end, he will at once settle the agitated question whether this lake be really, as some suggest, the ultimate southern water-basin of the Nile. If it should prove to be so, it follows that the altitude of Tanganyika, as given (by a bad instrument it is true) by Burton and Speke, was very erroneous, for by their measurement it was more than 800 feet below the level of the Albert Nyanza as fixed by Baker.

It is a circumstance of true gratification to me to know that Dr. Kirk, the tried and valued associate of Livingstone, should recently have been appointed the Government medical officer to the Resident at Zanzibar; so that in the absence of the Consul he will have ample opportunity of succouring his old leader, now the accredited Envoy to all the chiefs of Inner Africa. Dr. Kirk has also received authority from the Foreign Office to take every feasible step to obtain the release of the captives—if such there be—consisting of the crew and passengers of the *St. Abbs* Indiaman, the account of the shipwreck of which vessel on the Somaui coast was recently brought before the Society in a very telling manner by Colonel Rigby, formerly Consul at Zanzibar, and who was the zealous supporter of both the great African expeditions, which proceeded from that island.

Just after I had written the preceding lines, I learned with great

satisfaction, through a letter from Dr. Livingstone, of the 24th March, to his daughter, that he had reached the mouth of the Rovuma River in an Arab dhow, with his followers, and six camels, three asses, and three buffaloes. As it was found impracticable to ascend the Rovuma with the vessel, or disembark the animals on its banks, the party was taken on by Lieut. Garforth, R.N., to Mikeridamy, a fine harbour to the north of the Rovuma, where they were about to land when the letter was despatched. As the people of that tract are under the control of the Sultan of Zanzibar, with whose protection Livingstone is fully provided, and as the route is said to be open to the Lake Nyassa, our self-reliant and energetic envoy writes in the full persuasion that, with time and prudence, he will not only reach the watershed between Nyassa and Tanganyika, but be able to settle the question as to the elevation and drainage of the latter.

*Conclusion.*—This Address has now reached a length beyond that within which it was my wish to confine it, chiefly through the lamentable fact that several of our most eminent associates have passed away since our last anniversary; for you will doubtless all approve of my efforts, imperfect as they may have been, to do justice to their various merits. I have had also to dwell on the brilliant discovery of Baker, the meritorious explorations of the Purûs by Chandless, on the recent great opening out of Northern or Inter-tropical Australia, on the admirable progress of the Surveys of Northern India, and various other topics of deep interest to us all. But, far from diminishing our anticipations, each of these advances in distant lands has but laid open new vistas, which invite the enterprise of future travellers; whether it be in Africa, Central Asia, South America, or Australia, to say nothing of the untrodden interior of New Guinea.

So long as such fields of research remain, the Englishman of our day, and of the future, will, I doubt not, strive to penetrate unknown countries as ardently as his ancestors did in the days of a Raleigh or a Drake. It is, indeed, the high opinion which our countrymen entertain of any one who thus boldly adventures on the search after fresh knowledge, which is the mainspring of the continuous and advancing prosperity of the Royal Geographical Society.

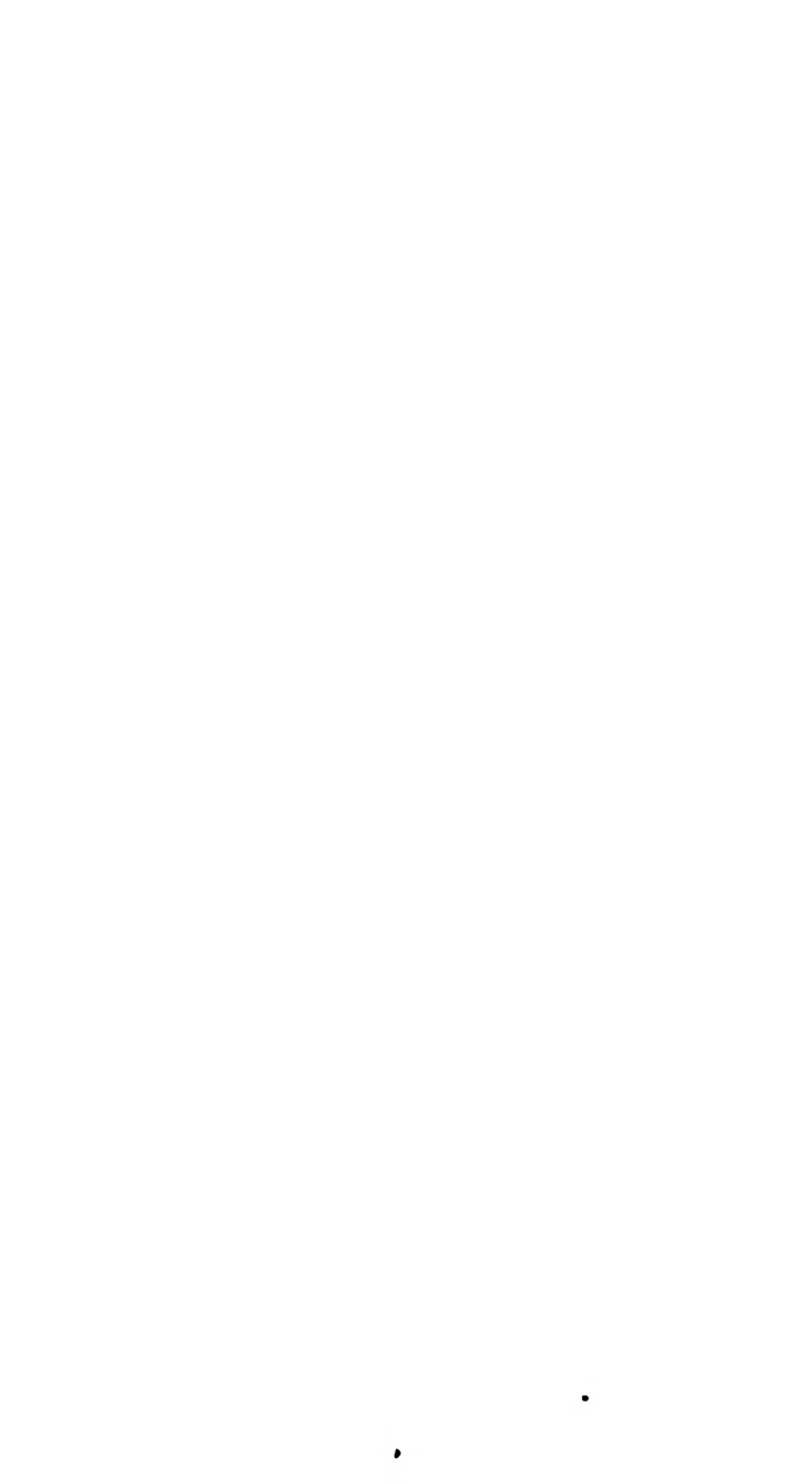
Let us, therefore, be of good heart when we look to the coming year, at the close of which, and on the termination of my duties as your President, I feel confident, that if I then be among you, I shall

have to congratulate you once more on uninterrupted success and new triumphs, and that it will only then remain for me to take leave of you with the hopeful watchword of all true geographers, "Forward, ever Forward."

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POSTSCRIPT.—*Meteorology*.—In the rapid and necessarily imperfect sketch given at p. 223 of the history of the recent advances in Meteorology, there are errors which call for correction. It ought to have been mentioned that the first great advance in Land Meteorology originated really in a joint recommendation of the Royal Society and British Association in 1839-40, in pursuance of which observations were carried into effect, at various points of the British Dominions, on a most extensive and systematic plan, and that the continuance and extension of the system was the special object of a Meteorological Congress which assembled at Cambridge in 1845, and which had a vast influence on the advance of the statistics of Land Meteorology. With regard to Ocean Meteorology, few but those who are occupied with such questions are aware of the great services rendered to this branch of science by General Sabine, the far-seeing President of the Royal Society, who, on the part of that body conducted a correspondence with the different departments of Government in 1852, and especially in 1855, which formed an epoch in Meteorological science.









PAPERS READ  
BEFORE THE  
ROYAL GEOGRAPHICAL SOCIETY

DURING THE SESSION 1865-66.

[FORMING VOL. XXXVI. OF THE SOCIETY'S JOURNAL.  
PUBLISHED APRIL 27TH, 1867.]

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I.—*Account of the Discovery of the second Great Lake of the Nile,*  
*Albert Nyanza.* By SAMUEL WHITE BAKER, Esq.

Read, November 13, 1865.

IN the year 1861 I commenced an expedition to discover the sources of the Nile, with the hope of meeting the East African Expedition of Captains Speke and Grant. I had not the presumption to make my intention public, as the Nile source had hitherto defied all explorers; but as the insignificant worm slowly bores its way into the hardest oak, even so I hoped by perseverance to reach the heart of Africa.

I employed the first year in exploring all the Nile tributaries from Abyssinia,—the Atbara, Settite, Royān, Salaam, Angrab, Rahad, Dinder,—and thence descended the banks of the Blue Nile to Khartūm. I will not describe this journey, but will confine myself to the most important point—the Great White Nile.

I completed my arrangements at Khartūm, and started on the 18th December, 1864, with a powerful force in three vessels, with twenty-nine transport animals, including horses, camels, and asses.

The first tributary to the White Nile is the Sobat, from the south-east, in lat.  $9^{\circ} 21' 14''$  N. This river is 120 yards wide and 28 feet deep, with a current of  $2\frac{1}{2}$  miles an hour, when bank-full, which it was at that time (December). It is not navigable for more than about 180 miles, as it is composed of seven or eight distinct streams, all shallow, the conjunction of which forms the main river.

Turning to the west from the Sobat junction, the Bahr Giraffe

is met with on the south bank; this is an inferior stream, being a mere arm of the Nile, which leaves the parent stream in the Aliab country about  $6^{\circ} 30'$  N. lat. Continuing west from the Bahr Giraffe we arrive at the Bahr Gazal junction coming from the west, about 70 miles from the Sobat junction. The Bahr Gazal is dead water. From that point to the south the difficulties of the White Nile commence. The entire country is a dead flat, a world of interminable marsh overgrown with high reeds and papyrus rush. Through this region of desolation the river winds its tortuous course like an entangled skein of thread; no wind is favourable, owing to the constant turns; the current adverse; no possibility of advance except by towing, the men struggling night and day through water and high rushes with the tow-rope, exhausted with a hopeless labour and maddened with clouds of mosquitoes.

Far as the eye can reach, in that land of misery and malaria, all is wretchedness. The dull croaking of waterfowl, the hum of insects, and the hoarse snort of the hippopotamus, impress the traveller that this is the mysterious Nile whose source lies hidden from mankind. Islands of vegetation silently float past, bearing solitary storks, thus voyaging on Nature's rafts from lands unknown. Nothing in life is so depressing as this melancholy river. One dry spot I saw slightly raised above the boundless marsh; there some white man was buried. The people were ignorant of his nation; but his bones, like a good ship stranded in her voyage, formed a sad landmark for the passer-by. Not far from that spot I also had to dig a muddy grave, and erect a rough cross over poor Johann Schmidt, a good and faithful German whom I had engaged for my expedition. He, at this early stage, fell a victim to the marsh fever—another wreck upon the fatal banks of the White Nile. The loss of a good man, my only European, so early in the voyage, affected me deeply. Sorrowfully I left him in that lonely spot, and struggled on against the stream to Gondokoro.

I arrived at Gondokoro after 45 days' voyage from Khartúm, about 750 miles in a direct line, lat.  $4^{\circ} 55'$  N. I landed all my animals in excellent order, and resolved to wait for the arrival of a trader's party from the south, according to my prearranged route, intending to form a *dépôt* at their station in latitude about  $3^{\circ} 15'$  N., to which I could fall back for supplies in case of need.

Gondokoro is a miserable place, consisting of a number of grass huts, occupied only at one season by the traders' people, when they return from the interior with their slaves and ivory. The soil is poor, but the country is pleasantly diversified with many ever-green trees and native villages, while the distant mountains, towards

the south and east, produce an exhilarating impression after the tedious White Nile marshes.

I had been 15 days waiting at Gondokoro, when suddenly I heard guns firing in the south, and my men rushed into my cabin, saying that the traders' party had arrived, with two white men—*Englishmen*—in their company, who had come from the sea! It is impossible to describe that moment. Quixotic dreams that I had cherished were now realised, and in a few minutes later I met those gallant explorers Captains Speke and Grant marching along the river's bank; arriving in honourable rags, careworn, haggard, but proud of having won.

Speke was my old friend, but I felt that his brave companion Grant was also an old friend, for such a meeting in the centre of Africa vanquishes all time, and the hearty shake of the hand effects more than the cold acquaintance of years. But one disappointment tinged this happy meeting. I had always hoped to have found them somewhere about the Nile source, and to have shared with them the honour of the discovery. I had my expedition in the most perfect order, and I was ready for any place however distant. Happily, much remained to be completed. Speke informed me that he had heard from the natives that a large lake existed to the west of Unyoro, which he thought might be a second source of the Nile, as the river flowed into it, and almost immediately after its junction issued from it, and continued its course to Gondokoro. He also said that he and Grant crossed the river at Karuma Falls in about 2° 20' N. lat., where they lost the river as it turned suddenly to the west; therefore it was of the highest importance to explore it from that point to the lake, which he called the Luta N'zigé. I immediately determined to undertake this exploration, feeling convinced that the reported lake had an important position in the basin of the Nile.

My hopes of success were considerably damped by the character of my men. In those unknown regions every species of villany can be perpetrated unpunished, and a collection of scoundrels, including Europeans, were engaged in the so-called ivory trade, having armed bands of ruffians in their service, who not only robbed the natives of their women and children to sell as slaves in the Soudan, but whose ivory purchases were conducted by *razzias* upon the cattle of the natives, the animals thus stolen being exchanged for elephants' tusks with the adjoining tribes. The trade of the White Nile is simply cattle-stealing, slave-hunting, and murder.

I had thus to encounter two great difficulties: the hostility of the natives, caused by the above conduct, and the impossibility of procuring porters for beads and bracelets, cattle being the only medium of exchange; added to this, my men engaged at Khartúm

as escort were the scum of the earth, accustomed to cattle-lifting and slave-hunting, and in the habit of receiving from their employers one-third of the cattle stolen. Foreseeing these difficulties when at Khartúm, I had applied, through the British Consul at Alexandria, to the Egyptian Government for a few troops as escort. This application was refused, although the Dutch ladies obtained Government soldiers and an officer through the application of the *French* Consul at Khartúm.

A few days after the departure of Speke and Grant from Gondokoro, my men mutinied and refused to proceed. The traders had combined to prevent any European traveller from penetrating the interior, fearing reports upon the slave trade. The people of Andrea Debono, who, having escorted Speke and Grant, had agreed to give me porters and to accompany me to their camp, suddenly started without me, sending a message that they would fire upon my party should I attempt to follow on their path. My armed men, forty in number, kept forcible possession of my arms that were in their hands, and threatened to fire at me simultaneously should I attempt to disarm them. It appeared utterly hopeless to proceed. The Bari tribe at Gondokoro and for about four days south were hostile to all comers. My expedition, so carefully organised, was overthrown and apparently defeated. The fatality that had attended all expeditions to the Nile sources for two thousand years hung heavily upon me.

I had no longer an escort. One man alone was faithful: he was a native of the Djour. This man and a little black boy of twelve years old were all that remained of my party, with the exception of my wife, who, with a devotion which woman alone can show, determined to face all dangers and hardships rather than that we should return defeated.

I will not weary you with a minute account of how, by management and caution, I recovered my arms and ammunition from the mutineers. Having succeeded in frightening a few of them, seventeen agreed to follow me to the *east*. My proper course was south; but I agreed to the proposal of the men, as they obstinately refused to proceed in any direction but east. I discovered that they had conspired to desert me at the camp of a trader, seven days' march east from Gondokoro: this was their reason for insisting upon that direction. They had also threatened to fire at me should I attempt to disarm them on the road, and to desert my wife in the jungle after my death. Nevertheless, it was imperative that I should advance from Gondokoro at all hazards, or give up the expedition. I trusted to gain an influence over my men when once in the interior, and to be able then to alter my course to the direction of the lake.

I endeavoured to make terms with a traders' party bound for

the east, but failed ; they sent word that they would fire at me if I followed their route, and that they would raise the Ellyria tribe against me in advance. This party started on the 26th of March, 1863, at about 2 P.M., and I determined to follow on their tracks that night and take my chance of overcoming all obstacles on the road. Not a single native was procurable, all being under the influence of the traders ; thus I had neither guide nor interpreter. I loaded my camels and asses, and at 7 P.M. followed in the direction the traders' party had taken.

I overtook them that night, bivouacked upon the road, and I pushed on ahead. The next morning I received two natives of the Latooka tribe, who, having been ill-treated by the Turks, had absconded. Fortunately I had been kind to these very men when in Gondokoro, and they, being natives of the country to which we were bound, offered to act as guides for a large present of beads and bracelets. Here, then, were guides ! and I determined to push on by a forced march at night to reach and pass through the Ellyria tribe before the Turks should arrive to raise that tribe against me.

The march of that night was heavy. The camels were carrying about 700 lbs. each ; the asses 200 lbs. I had twenty-nine animals. The route was through jungle and obstructed by numerous ravines, in crossing which the camels always fell and had to be unloaded. While they were being reloaded the tired donkeys took the opportunity of reposing and lying down ; they shifted all their packs, which thus had to be readjusted a dozen times in that one night's march.

The day broke, and we were still ahead of the Turks. I lightened the load, throwing away most of the salt and about 300 lbs. of all kinds of provisions, which, being left on the road, had the double advantage of lightening the burthens and delaying the Turks, who I knew would scramble and fight together for the spoil upon the route. At length I passed a place called Tollogo, about 30 miles east of Gondokoro, and threading a rocky pass at the foot of a range of fine granite mountains, I passed on to Ellyria, riding about a mile ahead of my party.

Tying our horses to a tree, my wife and I, alone in this beautiful spot, sat upon one of the huge blocks of granite that had fallen from the mountain top, and looked down upon the valley of Ellyria, about a mile before us. The noble mountains of grey granite rose on the borders of the chief village, while numerous other villages, surrounded by bamboo stockades, were dotted about the steep sides of the mountains. Looking down upon this valley in which our fate lay hidden, we anxiously awaited the arrival of our party—the road being difficult for the baggage-animals, owing to the numerous fragments of rock which block the pass.

We were exulting in having outmarched the Turks before they could raise the Ellyria tribe against us, when a clattering among the rocks preceded the appearance of what I supposed to be our party. To my confusion we saw the hated red flag and crescent, leading the Turks' party of 140 men. One by one they filed by through the narrow pass and descended to Ellyria. We were outmarched, and the expedition ruined should they raise the chief against us, he being the man who had massacred a trader's party of 126 armed men the year previous.

The captain of the party at length passed within a few yards of me in the rear of his men: my success depended upon that moment. I called him, and a present of a double-barrelled gun opened the conversation; it was terminated by English gold, which by good fortune I had with me—I had won him! I explained to him that it was impossible to drive me back, but should he assist me in my journey, I would reward him far beyond his annual salary. My men shortly arrived, and were confounded at seeing that I had made a friend of one of my greatest enemies.

After seven days' march we arrived at Latooka, my party slightly in the rear of the trader's. We reached the station of Chenooda, an opposition company to that which I had been following. It was at this spot that my men had conspired to mutiny. At daybreak the next morning the men refused to load the camels, and broke out in open mutiny with their arms in their hands. I made a severe example of the ringleader and thus cowed some of party, while some absconded with their arms and ammunition, and joined Chenooda's men. The party of Chenooda made an attack upon the Latookas, to procure slaves; but the Latookas, who are a splendid tribe, massacred them, entirely destroying 105 men, including four of my deserters. This event gave me the control of my remaining men, who, firmly believing in the "evil eye," imagined that I had some mysterious connection with this disaster.

Latooka is the finest country that I have seen in Africa: the natives are warlike, but friendly if well treated. A large tract of land is cultivated with several varieties of grain, enormous herds of cattle find ample pasturage, and the towns are large and thickly populated. Tarrangollé, the chief town, contains about 4000 houses. Every town is defended by a strong stockade, while sentries are posted day and night around the town upon high platforms. The men are, like all tribes of this part of Africa, completely naked, and they are distinguished from other tribes by a peculiar head-dress—the hair or wool being worked into a thick felt and arranged as a helmet; this is tastefully arranged with blue and red beads, and ornamented with polished copper-plates. The Latookas never bury the dead if slain in fight: those who die a natural death are exhumed after a few weeks' interment

—the bones are then placed in earthenware pots and exposed outside the town. Like all other tribes of the White Nile they have no idea of a Deity, nor even a vestige of superstition; they are mere brutes, whose only idea of earthly happiness is an unlimited supply of wives, cattle, and a kind of beer.

The country of Latooka is important as being on the east frontier of a mountain-range running from the south-east, which forms the watershed between the White Nile and the Sobat; the drainage to the east flowing to the Sobat, about 50 miles distant, by the River Kanietti, and that to the west flowing direct to the Nile. This mountain-range is from 4000 to 5000 feet high, and composed entirely of granite. My intention in leaving Gondokoro for this country was simply to make a move into the interior, whence I trusted to be able to change my route, and work round to the south-west to Unyoro, and from thence to the lake. Accordingly I crossed the mountain-range and steering south-west 40 miles from Latooka I arrived at Obbo in lat.  $4^{\circ} 2' N$ . The general level of the Obbo country is 2600 feet above the sea: it forms the watershed between the East and West, and has a great rainfall of ten months during the year. The soil being extremely rich, the country is covered with an impenetrable grass jungle, about 12 feet high, intermingled with wild grape-vines. The mountains are clothed with forests, the whole country abounding in elephants.

Cattle will not live, owing to the tsetse fly; thus the natives are inferior in strength to the Latookas, being badly fed. They are extremely indolent, and instead of cultivating their beautiful soil, they are contented with small patches of a wretched grain and a harvest of wild yams, which grow in abundance. I found nine varieties of yam growing wild in the Obbo jungles.

The chief of the Obbo tribe is an old man, a famous magician and rain-maker, much respected by all adjacent tribes as a powerful sorcerer. He carries a whistle of antelope's horn, which is supposed to have the power of either bringing or preventing rain. Unfortunately one day I happened in his presence to whistle shrilly with my fingers with a tone which utterly overpowered his magic horn. From that time I was considered to be an accomplished rain-maker, and was always requested to perform either to attract or to retard a shower. The old chief "Katchiba" has 116 children living, and all his villages are governed by various sons. When he visits a district he rides on a man's back, with a few attendants, while one of his wives carries a jar of beer to refresh both horse and rider. He thus journeys through his country to collect tribute: if not paid he curses the goats and fowls of his subjects, that they may remain barren, and threatens to withhold the rain.

In Obbo the whole of my transport animals died, and I was



utterly helpless. After a delay of many months, during which the rainfall was exceedingly great, I procured a few porters from the ivory trader, and having trained some riding oxen, I was prepared to start for Unyoro. I was forced to abandon nearly all my baggage, as my means of transport were very limited. My clothes and those of my wife had long since been bartered for provisions with the trader's men; thus my baggage was light, consisting of a simple change of linen, with a large supply of ammunition, and presents for the King of Unyoro (Kamrasi). I had been a martyr to fever, and my quinine was exhausted: my work still all before me. I had arranged to lead the trader's party into the Unyoro country, and to introduce them to Kamrasi, under the express conditions that they should deal fairly with the King.

We left Obbo on January 5, 1864, crossing the River Atabbi, which is an important tributary to the Asua River, flowing throughout the year. I passed through the Madi country to Shooa, in latitude  $3^{\circ} 4' \text{ N.}$ , crossing the Asua River in lat.  $3^{\circ} 12' \text{ N.}$  The Asua at that time (January 9) was dry, with the exception of a narrow stream, ankle-deep, trickling down its rocky bed. It is about 120 yards wide, but it is a simple mountain-torrent. The average depth in floods, judging by the water-mark on the banks, is 15 feet; so great is the inclination of its bed, that it forms a rapid during the rains, impassable by boats. The bed of the river was 1100 feet lower than Obbo; the drainage of a large extent of country thus flows to the Asua, and thence to the Nile.

Upon arrival at Shooa the whole of my porters deserted: this necessitated a further diminution of baggage. Rice, coffee, and every necessary, was forsaken, and, with a few men to carry ammunition and blankets, we pushed forwards towards Unyoro.

After five days' journey south, over uninhabited prairies of high grass and countless swampy hollows, we arrived at the Nile\* at Karuma Falls, at the very spot where Speke and Grant had crossed the river, in latitude  $2^{\circ} 17' \text{ N.}$  Instead of being welcomed by Kamrasi, as I had expected, we were not allowed to cross the river; crowds of armed men thronged the heights on the opposite bank to resist our landing. At length, after a long day lost in gesticulating and shouting our peaceful intentions, a boat came across the river with some head-men of the country, who, after strict examination, pronounced me to be Speke's own brother, "from one father and one mother." It now transpired that De-

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\* As that portion of the Nile which flows from the Victoria, into the Albert Nyanza, requires a separate name to distinguish it from the main river of the Nile flowing out of the Albert Nyanza, I have, on my original map, adhered to the name Somerset River, given to it by its discoverer Captain Speke on the map which he gave me at Gondokoro, and which I have handed over to the Royal Geographical Society.

bono's men, who had escorted Speke and Grant to Gondokoro the previous year, and who had driven me from my southerly route, had marched direct to Unyoro, and attacked Kamrasi's country, killing about three hundred people, and capturing many slaves. We were at first supposed to be some of that party. So strong was the suspicion of the natives, even after my examination, that none of the party were allowed to cross the river except my wife, my-elf, and two or three attendants. It was pitch-dark when we landed on the south bank just under Karuma Falls; and although met by a crowd playing upon flutes, horns, and drums, apparently with great rejoicing, we were detained for eight days before we were allowed to journey south to Kamrasi's residence.

From Karuma the Nile flows due west in a succession of powerful rapids between high cliffs. Immense groves of bananas clothed the steep ravines, and beautiful forest-trees, interspersed with varieties of palms, bordered the beautiful river, rushing along its rocky bed. Here the Nile was about 150 yards wide, a noble stream fresh from the Victoria Lake.

My first wish was to follow the river from this point to the supposed Luta N'zigé, but this was not permitted; neither could I obtain information of any kind from the people, as they had not yet received the King's orders. So suspicious was the King, that we were twelve days on a march of only 40 miles due south to his capital. We were only allowed to march about  $3\frac{1}{2}$  miles per day, to enable messengers to report our conduct daily to Kamrasi. This march was on the west bank of the Nile, and we arrived at the capital (M'rooli), at the junction of the Kafoor River with the Nile. The country throughout our route from Karuma was populated and extremely fertile.

The king did not appear for three days, during which we were by his orders confined on a wretched marsh, on the south side of the Kafoor River, precisely where Speke and Grant were located formerly. In rather a suspicious manner Kamrasi arrived, accompanied by about a thousand men. I was very ill with fever, and was carried on a litter to his hut. He was a fine, dignified-looking fellow, well dressed in bark-cloth, gracefully draped around him, and beautifully clean in his person; the nails of his hands and feet being perfectly white, and carefully attended to. He gave me seventeen cows, and a quantity of plantain wine; accordingly, I presented him with a variety of objects of value, including a handsome Persian carpet of most gorgeous colours, which captivated him immensely. I told him that Speke and Grant had arrived safely, and had spoken well of him, therefore I had come to thank him in the name of my country, and to present him with a few curiosities. I also told him that the Queen of my country had taken a great interest in the discovery of the Nile source, now proved to be

within his dominions, and that I wished to visit the Luta N'zigé Lake, and descend to the junction and the exit of the river. He told me that Speke was evidently my brother, having a beard precisely similar; that I was far too ill to attempt the march to the lake—which was the *M'wootan*, not *Luta N'zigé*—as it was *six months' journey*; that he was afraid I might die in his country, and perhaps my Queen would imagine I had been murdered, and might accordingly invade his territory. I replied that this was a perfectly correct idea—that no Englishman could be murdered with impunity; but that I had resolved not to leave his country until I had seen the lake, therefore the sooner the exploration was completed, the less chance there would be of my dying in his country.

I returned to my hut disheartened. I had now been fourteen months from Khartúm, struggling against every species of difficulty; for twelve months I had been employed in repairing guns, doctoring the sick, and attending the wounded of the ivory hunter's party, simply to gain sufficient influence to enable me to procure porters. That accomplished, I had arrived at this spot, M'rooli, in lat.  $1^{\circ} 37' N.$ , only 6 days' march from the Victoria Lake; and I had hoped that a 10 days' westerly march would enable me to reach the M'wootan N'zigé. I now heard that it was *six months' journey*! I was ill with daily fever, my wife likewise. I had no quinine, neither any supplies, such as coffee, tea, &c.; nothing but water and the common food of the natives—good enough when in strong health, but uneatable in sickness.

That night passed heavily; the following morning, to my dismay, every one of my porters had deserted. They had heard the King declare the journey to the lake to be *six months*, and all had absconded. Day after day I had interviews with the King Kamrasi, whose only object in seeing me was to extort all I had. I gave him everything he asked for except my sword: this was what he coveted.

The traders obtained a large quantity of ivory, and left the country, leaving me, with my thirteen men, sick and hopeless. I would not be persuaded to return: I felt sure that the lake was not so far distant. Hearing that the trade from the lake consisted of salt, I found a native dealer, and from him I obtained the cheering information that the lake was only 15 days distant. The King had deceived me, merely wishing to detain me with him in order to strip me of everything. At length I gave him the coveted sword and a double-barrelled gun; my head-man drank blood with him as a proof of amity, and he gave me two chiefs as guides and about 300 men as escort. These fellows were dressed like our juvenile ideas of devils, having horns upon their heads, and were grotesquely got up with false beards made of the bushy ends of

cows' tails. This motley escort gave much trouble on the journey, plundering the villages *en route*, and drawing all supplies before we had a chance of procuring anything. I therefore discharged my attendants after a few days' march, and continued the journey with my guides and porters. Every day the porters, apparently without reason, would suddenly throw their loads down, and bolt into the high grass, disappearing like so many rabbits. This occasioned much delay, as fresh men had to be collected from distant villages.

Marching for some days along the south bank of the Kafoor River, we had to cross this deep stream at a muddy ford. In crossing this river my wife suddenly fell apparently dead, struck by a *coup de soleil*. For seven days she was carried in a state of insensibility along our melancholy route; the rain in torrents, the country a series of swamps and forest and grass jungle—no possibility of resting in one place, as there was nothing to eat on the road, and our provisions were insufficient. The people put a new handle to the pickaxe to dig her grave, and looked for a dry spot. I was utterly exhausted with fever and watching, and, after a long march, I fell senseless by the side of her litter. The next morning a miraculous change had taken place, which I can never forget.

After 18 days' journey through a park-like country from M'rooli, the long-wished-for lake was announced by the guide. For three days I had seen a high range of mountains, apparently about 80 miles distant, and I had feared that these lay between me and the lake; to my great joy I now heard that they formed the opposite or western shore. Suddenly, upon reaching some rising ground, the great reservoir of the Nile lay before me! Far below, some 1500 feet beneath a precipitous cliff of granite, lay my prize, so hardly sought; a boundless sea-horizon south and south-west; while west, the faint blue mountains, of about 7000 feet above the water-level, hemmed in the glorious expanse of waters.

Weak and exhausted with more than twelvemonths' anxiety, toil, and sickness, I tottered down the steep and zigzag path, and in about two hours I reached the shore. The waves were rolling upon a beach of sand; and as I drank the water and bathed my face in the welcome flood with a feeling of true gratitude for success, I named this great basin of the Nile (subject to Her Majesty's permission) the "Albert Nyanza," in memory of a great man who had passed away. The Victoria and the Albert Lakes are the reservoirs of the Nile.

Vacovia was the spot where I first reached the lake, in lat.  $1^{\circ} 14' N$ . From that place I started in canoes, and, steering north, I coasted for 13 days, arriving at Magungo, in lat.  $2^{\circ} 16' N$ . There the lake had decreased in width to 16 or 20 miles, and it turned to the west; the extent unknown to the natives.

The village of Magungo was situated on rising ground about

250 feet above the lake; from this spot I had a beautiful view of the valley of the Nile, as the river flowed from the lake from 15 to 20 miles due north of our position. The valley was 4 or 5 miles wide; a great flat of green reeds marked the course of the river to the north as far as the eye could reach. A chain of hills bounded the west bank of the river, trending north-east. Below the village of Magungo the river which I had crossed at Karuma entered the lake, after a course of about 80 miles from Karuma Falls; thus the Nile entered the lake and almost immediately made its exit at the north, precisely as had been reported by the natives to Speke and Grant.

My voyage down the lake had been tedious, owing to the heavy sea which rose with the wind from the south-west every afternoon, and rendered it necessary to haul the canoe ashore. The scenery was extremely beautiful; the mountains of granite and gneiss rose in many places abruptly from the water to the height of 1200 to 1500 feet on the east shore; many streams rushed down precipitous ravines; and the fine cataract of the Kaigiri, in a grand body of water, fell from about 1000 feet. Two large falls were visible with the telescope, issuing from the high range of mountains on the west shore; in fact, all nature seemed to recognise this great depression as the grand reservoir.

Much salt is obtained from the soil on the east bank of the lake; this forms the sole article of trade of the population on its borders. Formerly Magungo was a town of considerable importance, as the trade from Karagwé, from 2° s. lat., was conducted in large boats sent by Rumanika, the king of that country, with cowrie shells and brass bracelets from Zanzibar in exchange for ivory. My interpreter (a woman of Magungo) told me that she had seen Arabs arrive at Magungo with those boats, who regularly brought cowrie shells every year in exchange for ivory and prepared skins. In a disagreement with the people some men were killed, and from that time no boats had arrived; thus cowrie shells were very scarce, and tribes to the north, *i.e.* the Madi and Obbo, who formerly sent to Magungo to purchase those shells, were now without a supply.

Kamrasi, and many natives, told me that the lake is known well as far as Karagwé; but from that part, between 1° and 2° s. lat., it turns to the west, the extent being unknown even to Rumanika, the King of Karagwé. Thus the Albert Lake is well known to an extent of about 260 geographical miles from south to north. Throughout this course it receives the drainage of a great equatorial mountain-range, where the rainfall continues through ten months of the year. When I reached the lake in March, it was shortly after the commencement of the rains (which begin in February); at that time the water was 4 feet below the highest water-mark upon some trees which grew in the lake near Magungo. The natives assured me that the level was never lower than at the

time I saw it; thus the maximum rise of the water-level in floods is 4 feet. From the exit of the Nile to lat.  $3^{\circ} 32' N.$  the Nile is navigable.

It was necessary to verify the river flowing into the lake at Magungo as the Nile I had crossed at Karuma, that being the river flowing from the Victoria Nyanza. At the junction with the Albert Nyanza it was a broad channel of dead water, banked by vast masses of high reeds. In fact the northern end of the Albert Lake seemed to form a delta, the shores being blocked with rush-banks. The whole character of the lake had changed from the open sea it had presented further south.

I went up the river from Magungo in a canoe. After the first 10 miles it had narrowed to a width of about 200 yards, without any perceptible stream. We slept that night on a mud-bank, within a few feet of the river; but on waking the next morning I distinctly noticed the floating vegetation slowly moving towards the west. Thus there was no doubt that this was actually the Karuma River, as the natives had informed me, flowing into the lake at Magungo.

About 25 miles from Magungo my boating terminated. For many hours I had heard the roaring of broken water; we now turned into a slight bend of the river, and the grand fall of the Nile rushed into our view. Hurrying through a gap in a granite rock the river contracted suddenly from a width of 150 or 200 yards to about 50 yards, forming a maddening rapid, which, roaring through its rock-bound channel, plunged in one leap, about 120 feet perpendicular, into a deep basin below. I took the liberty of naming this grandest object throughout the course of the Nile the "Murchison Falls."

I counted twenty-seven crocodiles upon one sandbank below the falls. I shot one, and, as we were putting the boat ashore, a hippopotamus which had been hidden in the reeds charged the canoe, lifting it out of the water, and very nearly terminated the voyage with a capsizing.

Leaving the canoes at a small fishing-village below the falls, we continued our route to the east, overland, parallel with the river. The war was raging between Kamrasi and a neighbouring chief, Fookooka, who lived upon some islands in the river. The whole country was plundered and deserted; my porters absconded, leaving us in utter helplessness without provisions. Here, laid down with fever and starvation, we remained for two months, living upon wild spinach and mouldy flour, now and then procuring a wretched fowl. During this time Kamrasi, who was camped with an army of 5000 men only four days distant, sent me repeated messages that I was to attack his enemy, Fookooka, with my guns. Should I accede to this, he promised to give me all I wanted, even to a portion of his kingdom. Being in extremity,

I at length sent my head-man to the King's camp with a message that I was far too great a man to be negotiated with by a third party, and that if Kamrasi wished me to fight his battles, he must send fifty men to carry me to his camp, as I was too ill to walk; we might then come to some understanding as to the proposed alliance. This bait took, and after some days I was carried to his camp and well supplied with provisions.

A few nights after my arrival there was a sudden uproar in the camp—hundreds of war-drums beating, horns blowing, and a mass of people dressed for battle, with horns upon their heads, and false beards; crowds rushed to and fro in the darkness, screaming and dancing with their spears, in the utmost confusion. Suddenly the king arrived in my hut, with a piece of blue baize tied round his loins like a kilt. This baize had been given him by Speke, and he confessed that he was thus lightly clad to enable him to *run away* quickly. It appeared that 150 of the trader Debono's scoundrels, armed with guns, had allied themselves to Fowooka, and, having crossed the river, were within 10 miles of our camp, together with several thousand natives marching against Kamrasi. I never saw any man in such a pitiable fright as the King. I hoisted the English ensign upon my flag-staff opposite my hut, and assured him that no harm should befall him if he would trust to its protection; at the same time I sent five of my men to summon the captain of Debono's party to appear. The men returned on the following day with ten men of Debono's, who candidly confessed their intention of killing Kamrasi and of capturing slaves. I declared the country to be under the protection of the British flag, and that I would hang the leader at Khartúm should one slave or head of cattle be stolen from Kamrasi's country. I gave them twelve hours to recross the river to the north side.

Curious to say, they submitted unconditionally; but, determined not to return without some booty, they actually attacked and plundered their own allies, after retreating across the river. This affair gave me immense influence with Kamrasi, but it did me much harm. I was so valuable to him that he would not allow me to leave his country. The season for the annual boats to depart from Gondokoro was passed, and I was a prisoner for twelve months until the following season. This was quite heartbreaking.

During this time M'tesa, the king of Uganda, had heard that I was on the way to visit him with presents, but that Kamrasi had detained me and received the presents intended for him; he therefore invaded Unyoro with a large army, and utterly devastated the country. Nothing would induce the coward Kamrasi to fight, and he took refuge on a river-island, forsaking me utterly, and not even supplying me with porters. I determined to push for Karuma and form a strong camp in the angle made by the bend of the river above the falls; but the enemy were on the road, we had no

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animals to ride, the oxen being all dead, and although weak and ill, my unfortunate wife and I were obliged to make a forced march throughout the whole night, stealing through the high grass on the skirt of the enemy's camp.

Arrived at Karuma, I sent messengers to the traders who had accompanied me the previous year. They shortly arrived and received from Kamrasi an immense amount of ivory which I had arranged he should give them. M'tesa's army retreated at the approach of the Turks' party of 150 guns, and I left Kamrasi's country on my road home. He had stripped me of everything except my guns and ammunition, and his last request was that I would give him the English flag that had saved him from the Turks. I was obliged to explain to him that the talisman failed unless in the hands of an Englishman.

In passing through the Bari tribe, on my return to Gondokoro, we were twice attacked by the natives, who surrounded the camp and complimented us with a few showers of poisoned arrows. A good shot or two from the sentry settled the matter, and we arrived safe at Gondokoro—the exploration thus happily concluded.

I have now a task to perform which weighs heavily upon me—it is to deliver to the President of the Royal Geographical Society a map which was given to me by my lamented friend Captain Speke previous to his departure from Gondokoro. This map is the last relic that I possess of that great explorer, and I had fondly hoped to have delivered it into his own hand and to have publicly thanked him for the great service it has rendered me. Alas! instead of meeting him, I see a subscription list for a monument to his memory. He being gone, I feel the deepest satisfaction in being able to substantiate the main points of his discoveries. So vast is Central Africa, and so insurmountable are the difficulties of that savage country, that it is impossible for a single party to complete so great an exploration as the sources of the Nile. I can only pay a just tribute to the extraordinary perseverance and determination of Captains Speke and Grant in having overcome obstacles which none but an African explorer can appreciate. Not only have they laid down upon this map what they have actually seen, but I have determined the correctness of their information, gathered from the natives, respecting the course of the river from Karuma to the Albert Lake, and its subsequent exit from that lake on its course to the Mediterranean. To these great explorers belongs the honour of discovering the Victoria Nile-source.

For myself I claim no honour as the discoverer of a *source*, as I believe the mighty Nile may have a thousand sources. The birth-place of that great river is the vast rock-basin of the Albert Nyanza.

In those profound depths, bosomed in the mountain-range of Equatorial Africa, in a region of ten months' rainfall, every drop of water, from the passing shower to the roaring mountain-torrent,



is stored in that great reservoir of Nature. Fifteen hundred feet below the general level of the country, in a precipitous depression, lies the great reservoir of the Nile. So vast is its volume of water, that no single stream appears to influence its level. Even the great river from the Victoria Lake enters the great reservoir absorbed without a perceptible current.

I will not enter upon vain theories of a connection between this lake and the Tanganyika, nor indulge in any wild hypothesis that may mislead the public. I wish to lay before the world the simple and straightforward narrative of my expedition for the benefit of geographical science, trusting that nearly five years passed in toil and anxiety in Central Africa have been of service in determining the great Basin of the Nile.

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*Heights of Stations above the Mean Level of the Sea determined by Boiling-water Observations by S. W. BAKER, Esq., computed by E. DUNKIN, Esq., of Greenwich Observatory.*

	Feet.
Tarrangollé .. .. .	2047
Olbo .. .. .	3480
Shoggo .. .. .	3770
Asua River .. .. .	2619
Shooa .. .. .	3619
Rionga's Island .. .. .	3685
Karuma, below falls .. .. .	3737
" south of falls .. .. .	3796
South of Karuma, at river level .. .. .	3794
M'rooli, river level, junction of Kafoor .. .. .	3796
West of M'rooli, on road to Albert Lake .. .. .	4291
Land above lake, east cliff .. .. .	4117
Albert Nyanza, lake level .. .. .	2448
Shooa Morru, island of Patocân .. .. .	2918
Gondokoro .. .. .	1636

The above heights will be found to differ considerably from those given by Mr. Baker in his letter, written from Khartûm in May last, and published in the 'Times' newspaper in June. This arises from Mr. Baker having corrected his observations, whilst in the interior of Africa, from what have since proved erroneous data: the above are the correct computations of the same observations.

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*Remarks on the Thermometer B. W., used by S. W. BAKER, Esq., in determining Heights. By Staff-Commander C. GEORGE, Curator of Maps, Royal Geographical Society.*

THIS thermometer was one of the three supplied by the Royal Geographical Society to Consul Petherick in 1861, and was made by Mr. Casella.

At Gondokoro, in March, 1862, it was lent to Mr. Baker, who made all his observations with it and brought it back safe: it has, therefore, been in use about  $4\frac{1}{2}$  years.

On November 9th, 1865, Mr. Baker returned it to the Royal Geographical Society, and it was immediately taken to Mr. Casella, who tested its accuracy by trying its boiling-point, in nearly the same manner as Mr. Baker had made his observations. The result by two independent observers was that the boiling-point had increased in its reading by  $0\cdot75$  in  $4\frac{1}{4}$  years, or  $0\cdot172$  yearly.

On November 23rd the thermometer was again tested by Mr. Baker at the Kew Observatory. The observation was made under the same conditions as those near the Albert Nyanza as nearly as it was possible to make it.\* The result gave the thermometer  $0\cdot80$  too much at the boiling-point.

The readings of the thermometer have, therefore, been *too much*, and by *reducing* the readings, it *elevates* all positions at which observations were made.

Table No. 1.—In this Table the error obtained at Kew Observatory has been treated like that of a chronometer, the error being assumed increasing and regular.

Table No. 2 is to correct the height, computed by Mr. Dunkin, using the quantity taken from No. 1 Table.

Table No. 3 is the final result of the observations for height, corrected for instrumental error.

TABLE No. 1.—Table for Increased Reading of Thermometer, using  $0\cdot80$  as the Result of Observations for its Error.

Month.	1861.	1862.	1863.	1864.	1865.
January .. .. .	..	$0\cdot143$	$0\cdot314$	$0\cdot487$	$0\cdot659$
February .. .. .	$0\cdot..$	$\cdot157$	$\cdot328$	$\cdot501$	$\cdot673$
March .. .. .	$0\cdot000$	$\cdot172$	$\cdot344$	$\cdot516$	$\cdot688$
April .. .. .	$\cdot014$	$\cdot186$	$\cdot358$	$\cdot530$	$\cdot702$
May .. .. .	$\cdot028$	$\cdot200$	$\cdot372$	$\cdot544$	$\cdot716$
June .. .. .	$\cdot043$	$\cdot214$	$\cdot387$	$\cdot559$	$\cdot730$
July .. .. .	$\cdot057$	$\cdot228$	$\cdot401$	$\cdot573$	$\cdot744$
August .. .. .	$\cdot071$	$\cdot243$	$\cdot415$	$\cdot587$	$\cdot758$
September .. .. .	$\cdot086$	$\cdot257$	$\cdot430$	$\cdot602$	$\cdot772$
October .. .. .	$\cdot100$	$\cdot271$	$\cdot444$	$\cdot616$	$\cdot786$
November .. .. .	$\cdot114$	$\cdot285$	$\cdot458$	$\cdot630$	$0\cdot800$
December .. .. .	$0\cdot129$	$0\cdot300$	$0\cdot473$	$0\cdot645$	..

TABLE No. 2.—At the elevation of 3500 feet,  $1^\circ$  equals about 520 feet, from which the following Table:—

$^\circ$	Feet.	$^\circ$	Feet.	$^\circ$	Feet.
$1\cdot0$ .. ..	520	$\cdot7$ .. ..	364	$\cdot3$ .. ..	156
$\cdot9$ .. ..	468	$\cdot6$ .. ..	312	$\cdot25$ .. ..	130
$\cdot8$ .. ..	416	$\cdot5$ .. ..	260	$\cdot2$ .. ..	104
$\cdot75$ .. ..	390	$\cdot4$ .. ..	208	$\cdot1$ .. ..	52

\* By immersion in boiling water.

TABLE No. 3.

Date.	Name of Place.	Approximate Position.		Reading of Thermometer, B. F.	Temperature.	Height.		
		Latitude.	Longitude.			Baker.	Dunkin.	Key Correction.
		° ' "	° ' "	°		feet.	feet.	feet.
April 13, 1863	Tar angollé (Latooka)	4 30 N.	32 55 E.	208.5	89	2003	2047	189
May 6 "	Obbo (camp)	4 02 "	32 31 "	206.0	76	3365	3480	194
" 12 "	Shogro (Farajoke)	3 32 "	32 32 "	205.5	75	3643	3770	196
Jan. 12, 1864	Asua River	3 12 "	32 11 "	207.5	82	2543	2619	256
" 15 "	Shoan	3 4 "	32 4 "	205.8	82	3522	3619	258
" 22 "	Rouga's Island, 80 feet above river	2 18 "	32 9 "	205.7	84	3400	3085	259
" 25 "	Karuma, below falls (Atala)	2 15 "	32 26 "	205.6	82	3637	3737	259
" 31 "	" south of falls, on road to M'rooli	2 10 "	32 29 "	205.5	84	3708	3796	260
" 31 "	" south of, at river level	1 53 "	32 26 "	205.4	84	3766	3794	260
Feb. 21 "	M'rooli, river level junction of Kafoor	1 38 "	32 20 "	205.5	82	3695	3796	265
Mar. 9 "	West of M'rooli, on road to Albert Lake	1 13 "	31 24 "	204.5	80	4254	4291	271
" 12 "	Land above lake, forming east cliff	1 15 "	30 51 "	204.8	80	4085	4117	271
" 14 "	Albert Nyanza, lake level	1 14 "	30 50 "	207.8	84	2388	2448	272
April 7 "	Shoan Moru (Island Pitoon)	2 16 "	31 55 "	207.0	84	2843	2918	277
Mar. 21, 1865	Gondokoro*	4 54 "	31 46 "	209.2	86	1592	1636	363

\* Dr. Doke, in the 'Sources of the Nile,' published in 1860, from page 30 to 36, investigates the levels of the Nile from Cairo to Gondokoro; at page 36 he makes the latter place 1911 feet above the level of the sea—a remarkable coincidence with the above.



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lains of Promise

Published for the Journal of the "Linnæan" Society by Martin, 13, Mark Lane, London, E.C.

II.—*An Overland Expedition from Port Denison to Cape York; under the command of F. and A. Jardine, Esqrs.* By Mr. RICHARDSON, Surveyor to the Expedition.

*Real*, November 27, 1865.

THE Queensland Government having made arrangements for forming a settlement at Cape York, it became necessary to adopt some plan by means of which Cape York settlers could be supplied with fresh meat and other necessaries. Mr. Frank Jardine then agreed to take a herd of cattle overland to meet the wants of the settlement, and at the same time to open up the unexplored country of the peninsula without going out of his road. I was appointed to accompany the party as surveyor; and a grant of 150*l.* was made by the Government to supply me with horses and necessaries for the trip. A sextant, artificial horizon, prismatic compass, Gregory-compass, and barometer were also supplied. My duties were defined in a letter from A. C. Gregory, Esq., the Surveyor-General. They were as follows:—To keep a field-book of the route, and in it to notice the nature of the soil, timber, grasses, and so forth; also the abundance or scarcity of water, any suitable place for settlement, &c.

The party left Rockhampton on the 14th of May, 1864, under the superintendence of Mr. A. Jardine, and journeyed, by the old road to Port Denison, as far as Macdonald's station on the Bogie River; then to a good camping-ground on the north bank of the river Burdekin, within 12 miles of Mr. Anthill's station, crossing that river at Hamilton's public-house. The party was then ten in number, and consisted of the following persons: Messrs. A. Jardine, Scrutton, Binney, and Conderoy, and six black boys—Euler, Peter, Sambo, Barney, Charley, and Pluto. They reached the camping-ground on the 17th of June, 1864. They had with them thirty-one horses. Mr. Frank Jardine and I reached Port Denison, from Rockhampton, in the *Diamantina*, s. s., Captain Champion, having touched at Port Mackay, about the 16th of July. The leader then purchased five horses for my use with the money which had been granted for that purpose.

In a week's time, agreeably spent by me at Burdekin Downs, the party reached that station. I then joined them, and we proceeded to "Reedy Lake," and encamped there.

Shortly before leaving Reedy Lake our advanced party was enlarged by the addition of two persons—Mr. Bode, a gentleman in search of new country, and his black boy. His path and ours being the same we journeyed on together. We left Reedy Lake on the 17th of August, 1864, and on the 24th reached the station

of Messrs. Firth and Atkinson, Upper Burdekin, near which we encamped.

*Aug. 26.*—Travelled about 17 miles w. by s. over broken ridges, lightly timbered with ironbark, moderately-well grassed, but now very dry. Encamped on the west border of a small plain, without finding water.

*27th.*—Travelled about 16 miles w. by s. At 6 miles from our last camp crossed the range dividing the water of the supposed Lynd and Burdekin rivers; both the ascent and descent were very gradual; the remaining 10 miles undulating, open, ironbark forest, well grassed, but no water until the end of our day's journey, when we encamped near some water-holes, on the western side of a small black-soil plain, the grass of which had been burnt.

*28th.*—Travelled about 14 miles w.n.w. through what would generally be called good country, although at this season very dry. On our way we noticed small-leaved bauhinia, myrtle, and grevillia. Passed the homestead of Mr. McKinnon, encamping about 3 miles beyond, on the north-east bank of a creek, then supposed to be the Lynd River of Leichhardt. Abundance of water in the creek, near our camp, and, immediately opposite, a low basaltic ridge appears a few yards from the bank of the creek, which latter is lined on both sides with melaleuca. In its bed are basalt and mica slate. Floodmarks 2 feet above the bank. Latitude  $18^{\circ} 55' 23''$ .

*29th.*—Travelled about 15 miles north-west. At first stony ridges, timbered chiefly with ironbark; afterwards the soil became more sandy, and we noticed bloodwood, acacia, and apple-gum, and some good grass. At 11 miles from the last camp we crossed the creek, whose sandy bed is there dry and shallow, 60 yards wide, having in it masses of basalt and mica-slate. At 4 miles beyond the crossing-place we encamped near an excellent water-hole in the creek. The adjacent country to our left, while travelling this distance, appeared to be scrubby. The bed of the creek is frequently filled with melaleuca.

*30th.*—Travelled about 13 miles north-west, the creek running nearly parallel with us—open undulating ironbark forest, tolerably well grassed—soil sandy. At this distance from last camp we reached the homestead of Mr. Yates, then crossing the creek, which is there about 70 yards wide, sandy bed, with masses of mica-slate, and banks 15 feet deep, continued on our journey, over a basaltic flat, lightly timbered with box for one mile E.N.E., crossing and encamping on the north side of an ana-branch of the creek above-mentioned, within a quarter of a mile of the homestead of J. G. Macdonald, Esq.,—our resting-place until the cattle are purchased.

Messrs. A. Jardine and Bode, with two black boys, leave the camp, taking with them a fortnight's provisions. Their intention is to follow down the creek near which we are encamped, supposed to be the Lynd River, as far as its junction with the Mitchell, observing which side of the creek was most suitable for travelling. During their absence I took seven sets of lunar observations, the result of which gave a mean longitude  $144^{\circ} 3' 30''$  E. of Greenwich, in latitude  $18^{\circ} 37' 10''$  S., as the mean latitude from several northern and southern observations. The variation of the compass I found, by theodolite (not a very good one) to be about  $6^{\circ}$  E. The prismatic compass with which I was provided had no coloured glasses nor any reflector.

*August and September.*—After being absent for nearly three weeks, Messrs. A. Jardine and Bode return, much puzzled with regard to the course of the supposed River Lynd. They had followed it down for about 180 miles, and say that the last 60 miles they were travelling nearly due west. Mr. Jardine plotted his course roughly on a sheet of foolscap (120 miles of the distance I afterwards found to be tolerably correct); and I gave it as my opinion that we were on the main branch of the River Gilbert. We afterwards found the river, shown in the map by a dotted line, as a branch of the River Lynd, was a new river, and is probably the main branch of the River Gilbert. We named it the River Einnasleigh. I ascended a hill about 1 mile to the N.E. of our camp, and obtained several bearings of adjacent mountains and ranges. The surrounding country is mountainous on all sides except south and south-east, and the smoke of burning grass is to be seen in all directions, occasioned by the blacks.

*Oct. 6.*—The cattle are here, and start in a few days—about 250 head. Our leader thinks it necessary to reduce the party; and two black boys, Charley and Pluto, are to be left behind.

*11th.*—Our party numbered ten persons, 36 horses, both pack and saddle, and three tents, as well as provisions, estimated to last us, with care, four months. We travelled about 19 miles, our general course being N.W. by N.: the first four miles of our journey being over basaltic flats, timbered with box and apple-gum; the remainder ridges, both sandy and stony, tolerably well grassed, and timbered with ironbark. Encamped near the river in latitude  $18^{\circ} 23' 59''$ .

About a mile up the river from this camp it is joined by a large creek from the south-east, and 5 miles beyond its mouth the river is shut in by a long rocky range trending south-west. The river is here about 250 yards wide, and its bed filled with huge masses of granite and basalt, its banks sloping and rocky. Water good and plentiful, but not running.

*12th.*—Shifted our camp one mile to the N.N.E. to the bank



of a small lagoon, within a quarter of a mile of the river. The horses enjoyed good grass, fresh and green, for the rest of the day.

Box, barringtonia, flooded gum, and pandanus were the prevailing varieties found here.

13th.—Travelled about 10 miles N.N.W., 5 miles sandy ridges, timbered chiefly with box-trees of small girth; the remaining distance the ridges became stony. Seven miles from camp we passed a fine reach of water in the river, which is there about 500 yards wide and filled with masses of basalt. Some prominent peaks rise from broken country to the east; to the westward the rocky range, before mentioned, continues to run nearly parallel with the river, having a steep rocky bluff nearly opposite our camp. I have named this Startwell Bluff. Encamped on the bank of the river, which is here broad and shallow; its bed is filled with melaleuca, and some excellent water in rocky holes. Grass very dry.

14th.—Travelled about 11 miles north-west; irregular ridges, very rocky and difficult for the horses and cattle, quartz, basalt, and a rock full of large leaflets of mica. Across the river the country is mountainous and broken, and on this side the grass has been recently burned by the natives. The river-bed is broad, shallow, and more sandy, and is joined by a deep, sandy, dry creek, 80 yards wide, coming from E.N.E., its banks steep and lined with immense melaleuca-trees. We encamped on its north bank near the river, and found water in the creek by digging. Noticed blood-wood and the Leichhardt-tree and ironbark.

15th.—Travelled to-day about 8 miles N.W. by N.; at first ironbark forest and sandy ridges, basalt cropping up in places; afterwards basalt became more plentiful, and made travelling difficult. The river-bank was intersected by deep gullies, and at 4 miles from last camp its bed narrowed to 150 yards, one deep sandy channel, banks lined with melaleuca. At about 7 miles from last camp we were compelled to leave the river, whose bed is there filled with masses of rock, it is also shut in on both sides by abrupt rocky ranges. We then crossed a low basaltic ridge and flat, and encamped near a large swamp, on its western side, not deep. I ascended the range to the north of our camp, and had a capital view of the surrounding country. The rocky range before mentioned, of which Startwell Bluff is a prominent point, from thence makes a great bend to the west, and then north, running into the river a mile or two to the north of our present camp. The country enclosed by the range and river appears to be level. To the east I saw nothing but rocky ranges quite near us, but to the S.E. by W. my view extended for at least 25 miles, enabling me to note the bearing of a prominent peak at that distance (Carl's Peak).

Latitude  $18^{\circ} 2' 7''$ . The mean of a north and south observation.

16th.—Travelled to-day about 11 miles, our general course being N.N.W., passing through a gap in the range about  $2\frac{1}{2}$  miles to the north-east of our camp. The remaining part of our journey was difficult travelling; basaltic flats and ridges openly timbered, and all the grass burnt. We encamped on the eastern bank of a creek which took its rise near the range. The creek is connected with the river by a channel near our present camp; it was named Parallel Creek by Mr. A. Jardine, on his previous exploration-trip down this river, although from this point it becomes an ana-branch. We enjoy fine strong breezes from the eastward, with fine clear weather. The thermometer reading  $73^{\circ}$  at sunrise this morning.

17th.—To-day our journey was much shorter than usual, in consequence of the difficult nature of the country. We continued our course for  $7\frac{1}{2}$  miles north-west down Parallel Creek, being frequently compelled to travel in its bed, and as often obliged to leave it. It is separated from the river by a high ridge of basalt, and its bed, when not filled with masses of rock, is sandy and timbered with melaleuca. its north-east bank is frequently very abrupt and rocky; some good grass grows amongst the basalt, but much of it has been burned by the natives. We encamped on the north-east bank of the creek, where it is not rocky, and where its slope towards the creek is gradual. The basaltic ridge immediately opposite our camp is abrupt, and from 60 to 70 feet high. About a quarter of a mile up the creek from camp the rocky bank on the north-east side ends in a sandstone cliff, worn into caves and hollows by weather and time.

Latitude  $17^{\circ} 51' 5''$ .

18th.—Our journey to-day of about  $10\frac{1}{2}$  miles, a little to the north of W.N.W., was performed over country similar to that yesterday described, but more rocky and difficult. Water was more frequently found in the bed of the creek, although near our camp it was not plentiful. To the eastward broken country is still apparent, but ranges and hills are becoming less frequent. The ana-branch is here about 300 yards wide, and filled with tall melaleuca.

19th.—At about  $3\frac{1}{2}$  miles from last camp the ana-branch joins the river, which is there 500 yards wide, and an immense sand-bed, having in it large masses of granite, porphyry and sandstone. Our general course to-day has been W. by N. about 8 miles. From the junction downwards it is stiff sandy bank, openly timbered with box and bloodwood, and travelling is much easier. Quartz ridges, densely clothed with scrub, are seen from the river-bank in a north-east direction.

Latitude  $17^{\circ} 45' 40''$ .

20th.—Continued our journey down the north-eastern bank of the river for about 11 miles in a north-westerly direction. The first 7 miles exceedingly rocky ridges, in many places running abruptly into the river, and intersected by very deep gullies. We avoided some of these by travelling at about a mile from the river; beyond that distance there is much scrub. The last 4 miles, low sandstone ridges, open forest on the river frontage, and timbered with larger trees, box, bloodwood, and gum. Soil very light and rotten, and grasses very coarse.

At about 4 miles from last camp the bed of the river is divided into channels by a high rock, three-quarters of a mile in length. A fine sheet of water is contained between this rock and the north-east bank; in this gorge I noticed flood-marks 30 feet above the bed of the river. Could not get a good view of the neighbouring country, but caught a glimpse of some low ranges to the westward. At our camp the river-bank is low, and the bed densely timbered with melaleuca, and occasional Leichhardt-trees.

Encamped near a good but shallow water-hole in the river.

21st.—Continued our course down the north bank of the river for about 11 miles W.N.W., the country becoming more open as we proceeded. To our right low sandstone ranges, partly covered with scrub and having abrupt sides, terminated at 200 or 300 yards from the river, between the spurs and along the frontage of the river. Box-flats, openly timbered, firm soil, and good grasses. Encamped near a fine long water-hole in the river, which furnished us with some excellent cod, bream, and catfish.

22nd.—Travelled to-day about 10 miles west; the country becoming still more open and the box-flats more extensive, as well as better grassed; gullies less numerous and the banks of the river low, the bed still wide, well watered, and sandy. Encamped on the north-west side of a small creek, plenty of water in water-holes in its bed, about half-a-mile from the river, which is here three-quarters of a mile wide, sandy bed, filled with small melaleuca trees, and having low banks.

Latitude  $17^{\circ} 34' 32''$ .

It was the wish of our leader, Mr. F. Jardine, to get on to the River Lynd, and to follow it to its junction with the River Mitchell, continuing our course down that river as far as would be thought necessary to avoid any difficulty in finding water. Mr. A. Jardine had previously mentioned this good camping-ground as a suitable place for the horses and cattle, pending another advance exploration trip they (Messrs. F. and A. Jardine) had in view, to the northward.

I plotted up my courses, and said that 18 to 20 miles N.N.E. from camp they ought to strike the River Lynd.

24th.—The brothers, taking with them Euler and the necessary provisions, left us to-day.

27th.—They returned to-day, and their report was unsatisfactory. Following a N.E. course, they came upon a creek, which I take to be Turning Creek, running in the same direction, and afterwards a large creek, which should be the Lynd River. At the distance above mentioned, Leichhardt's description of the neighbouring country does not at all coincide with the sort of country on the creek. Our leader and his brother say they were down the creek for about 50 miles. The country either densely timbered or clothed with tea-tree scrub, little or no grass, and water only to be found in lagoons near the creek. Mr. A. Jardine does not think it is the Lynd River of Leichhardt. I do, for two reasons:—1st. Its distance from our camp is what I expected it would be; and 2nd. Its general course is the same.

I know my starting point to be correct as regards latitude, and I think I have its position east from Greenwich nearly right. We have with us two maps, one a tracing furnished me by the Surveyor-General and the other 'Buxton's map of Queensland.' One places the River Lynd about 30 miles east of the place assigned to it in the other. I have assumed the former to be correct—that is the tracing.

While at this, our 13th camp, I ascended a low range to the north-east, three-quarters of a mile distant. To the north-west and west low sandstone ranges, and one to the south, distant about 15 miles. A low range also to the E.N.E. 18 miles, elsewhere nearly level country. A lagoon across the river about  $3\frac{1}{2}$  miles from camp in a box-forest, very open, and grasses very dry, and several on this side of the river 5 or 6 miles from camp; in one of these some very large catfish were caught, but the rocky bottom was a great annoyance to the fishermen. Near the camp there are box, bloodwood, acacia, apple-gum, and the Leichhardt-tree.

The black boys have been very successful in finding large quantities of the honey of the native bee, and I have named the creek near which we are encamped Cooroora Creek in consequence.

29th.—Mr. F. Jardine and his brother, with Euler, again leave us, intending to travel northward until they reach the River Mitchell. The remainder of the party are to follow a marked tree line, and to encamp near the supposed Lynd, on the bank of a small lagoon, there to await their return. Mr. Jardine has requested me to name the river we are about to leave "The Einnasleigh."

31st.—Leave our 13th camp. Horses in good condition and cattle doing well, and travel about 4 miles generally N. by E., encamping on a creek or water-course, running south-east, and holding

a little dirty but drinkable water in small holes. Flat box-forest, and very little grass.

*Nov. 1.*—Travelled to-day about 14 miles N.N.E., encamping on the south-west side of a small lagoon, about 200 yards from the supposed River Lynd. The first mile box-forest, and remainder of the journey gently undulating sandy ridges, poorly grassed, but densely timbered with tea-tree, rusty gum, bloodwood, stringy bark, acacia, and occasionally pandanus. At about 8 miles from last camp we came to a small creek, dry sandy bed; a little water was found in it where sandstone was cropping up. The bed was 4 or 5 feet deep. About 1 mile further on we passed a spring, covering a small flat near the creek. From this point into camp we passed some enormous ant-hills, 8 to 10 feet high and 20 to 30 feet in circumference. Near the camp grows a fine shady tree, about 30 feet in height, branches slightly drooping, and bearing an oval yellow fruit, pulpy when ripe, with a rough stone inside.

Latitude  $17^{\circ} 23' 24''$ .

*3rd.*—Our leader and his brother returned to-day; they report having been as far north as 56 miles from this camp, through wretched country, with a further prospect anything but favourable.

*4th.*—Travelled to-day about 5 miles north, crossing the River Lynd at about half-a-mile from last camp, and at three-quarters of a mile passing a small lagoon. Low sandy ridges, little or no grass, and densely timbered with tea-tree, some bloodwood, stringy-bark, and a little box. The river, where we crossed it, was about 100 yards wide, several channels, and bed scrubby, 8 to 12 feet deep. We afterwards found that the river here mentioned as the River Lynd was a branch of the River Staaten. We have named it "Byerley Creek."

*5th.*—Mr. F. and A. Jardine, with Binney, Euler, and Barney, go forward, taking the cattle with them.

This afternoon the long dry grass in which we had unpacked caught fire, and defied our efforts to put it out. We saw that no time was to be lost, and by great exertion removed the packs and saddles, and sundry scattered articles, to a large ant-hill to windward of the fire, where the grass was much shorter. There were only Scrutton, Conderoy, and I in camp, and we worked like horses, beating the fire down with blankets all round the ant-hill, Scrutton even rushing to one of two packs burning furiously and rescuing some flasks of gunpowder, the solder of the flasks running off at the time. The heat was suffocating, and we were all nearly leaving everything to its fate several times, when finally a few billies full of water prevented further danger. On examining the things that were saved, we found that every pack had been singed somewhere, and many straps and surcingles spoiled.

6th and 7th.—Some horses still absent.

8th.—Found all our horses and travelled about 15 miles N.  $\frac{1}{2}$  W.; either barren or very poorly grassed low sandy ridges, clothed with tea-tree scrub and a kind of brigalow, some stringy bark, acacia, and bloodwood. Another horse—one of those purchased for my use—unable to travel, poisoned, we think. We were obliged to leave him behind. Encamped near a small water-hole, in a sandy dry creek, having sandstone in its bed.

9th.—Similar country to that of yesterday, very little or no grass, and no water in the dry sandy creeks, although some was found by digging in their beds; many pandanus palms grew on their banks. Our general course to-day was N.  $\frac{1}{2}$  W., 16 miles, when we joined the advance party.

We encamped on the north-east bank of a creek (Cockburn Creek, a branch of Byerly Creek), 50 yards wide, coming from the E.S.E., after running it down for half-a-mile from the crossing place. Its bed is much filled with sandstone and plenty of water. On its banks grow melaleuca and flooded gum. Floodmarks 8 to 10 feet above the level of the bed.

Latitude 16° 56' 6".

10th.—Messrs. F. and A. Jardine, with Euler, again leave us, with instructions to continue our course down the creek for three or four days, should we find water, and there to encamp and await their return. It would be impossible to continue travelling northward through this country, and we think there is a possibility of finding more open travelling near the creek, as well as grass and water; in fact, this is the only course open to us. Travelled to-day about 7 miles north-west, crossing the creek near our last camp, and again near our present one. It contains some fine water-holes and a good deal of sandstone. Both sides are densely timbered and poorly grassed. Encamped on the north-west bank of the creek.

11th.—Continued our course down the creek for about 7 miles in a westerly direction, similar to that of yesterday; water still plentiful in the creek. Encamped on the south-west bank of the creek, with a forest of bloodwood saplings behind us, and a little fresh grass.

Latitude 16° 51' 31".

12th.—Continued our journey down the creek for about 6 miles N.W. by W. Its bed becomes more sandy and full of trees—melaleuca, nonda, and many others new to me. Water less plentiful. Encamped near a small water-hole in the creek. The appearance of the country does not change. We met with the green-tree ant here in large numbers, and the bite not so painful as we expected.

13th.—Travelled to-day about 3 $\frac{1}{2}$  miles N.W. by W., encamping near some small lagoons within sight of the creek, where a little water was also to be found; half-a-mile from creek low sandy

ridges, timbered with tea-tree. In the neighbourhood of this camp there is a little fresh grass. Bloodwood, acacia, stringy-bark, and gum, and nonda.

Latitude  $16^{\circ} 46' 5''$ .

14th.—Remained in camp.

15th.—Our leader returns, telling us he has seen the Mitchell River, but that the country is wretched, and to the northward worse, so that we must continue to travel near the river.

16th.—Continued our course down the creek for about 11 miles N.W. by W. The appearance of the country much the same—in some places so densely timbered, and so much undergrowth of trees and small saplings, that it is difficult to see more than 100 yards in any direction. Encamped in the sandy bed of the creek, which has two channels, banks not abrupt, 10 feet high, water plentiful, grass long, dry, and poor. Bloodwood, nonda, acacia, and stringy-bark; in creek, melaleuca and flooded gum.

17th.—Travelled to-day about 11 miles W.N.W. and at 5 miles from last camp the creek we have followed (Byerley Creek) joins the Lynd River (?) which comes from the south-east, bed 200 yards wide, two channels, sandy, dry, and banks low. We crossed it and continued our course down its south-west side, which is quite as densely timbered as the creek we have just left. (Mr. F. Jardine desires me to name it Cockburn Creek.) Encamped in the bed of the river, which there has several channels, and is 300 yards wide.

18th.—Travelled down the north-east bank of the River Staaten, about  $4\frac{1}{2}$  miles, N.W. by N.; at this point it joins a river coming from the E. by S., 300 yards wide, sandy bed, several channels, water in holes, banks low, sandstone cropping up in places. We encamped about  $3\frac{1}{2}$  miles further on, in a westerly direction, in the bed of the river, which is broad, and timbered all across with melaleuca; water only to be found in holes. A scrubby kind of brushwood grows on its banks, 200 yards from the river on either side. Flat country covered with tea-tree, scrub, and desert-grass, no kind of use whatever for pastoral purposes.

Latitude  $16^{\circ} 32' 17''$ .

Although the latitude of the junction of the Lynd and Mitchell rivers differs slightly from the latitude of the junction we have just passed, the appearance of a broad river coming from the same direction confirms me in the opinion I held at the 15th camp that we were on the River Lynd. The description of country, however, differs widely from Leichhardt's accounts of the country he saw on the Lynd, and makes me doubtful, for I am not positively certain that my longitude at Macdonald's was correct, though I cannot think it was considerably in error. The only course open to us at present is to follow this river down to the coast, leaving it when the country opens sufficiently.

19th.—Travelled about  $9\frac{1}{2}$  miles w.  $\frac{1}{2}$  s., about one mile distant from and nearly parallel with the river on its northern side, encamping near one of the chain of lagoons on its north side. The horses and cattle get some picking near the edge of the water; elsewhere the grasses are dry and poor. The bed of the river is here free from fallen trees, and has some sheets of not deep water. The banks are scrubby, and in some parts are water-worn by floods. We saw a little triodia, many kinds of acacia, and handsome nondatrees, loaded with fruit. A shower of rain from the west.

20th.—Travelled about 9 miles due west through tea-tree forest, flat country. Encamping near the river-bank in sand, to avoid a shower of rain from the west.

In the evening we were startled by a shout from one of our black boys, who espied about twenty natives coming up from the river-bank. The sun was nearly down, and they took care to have him at their backs. They were fully armed and painted, danced and shouted a little while like maniacs, and began to throw their spears. Two shots from our rifles scattered without touching any of them. Fortunately none of the party were hit, although a spear passed between O'nderoy's legs, quite near enough.

21st.—This morning thirteen of our horses were missing, so we packed all the available ones, and walking ourselves, shifted the camp to one of a fine chain of lagoons, about 3 miles w. by s., one mile from the river on its north side. At our last camp water was scarce. Here we have abundance, and a little feed for the horses and cattle. As far as we ourselves are concerned, this is the best camp we have had. The country is more open, and a decided improvement in the grasses. A little box, bloodwood, rusty-gum, and farther from the river tea-tree levels.

Latitude  $16^{\circ} 32' 45''$ .

27th.—Up to this date we remained in camp, while the black boys were searching for the horses and some cattle that had also got away. Recovered our horses this morning and travelled about 8 miles w.n.w., following the chain of lagoons, which, lower down, form a creek, encamping near the last. Country on either side tea-tree levels, near the river scrubby, without a blade of grass excepting that found on the banks of the lagoons. The river is distant from camp about 3 miles due south, 150 yards wide, clear sandy bed, and some sheets of shallow water. The banks are not abrupt, but water-worn, in places laying bare the sandstone.

28th.—The chain of lagoons here breaks into a creek, running w.n.w.  $\frac{1}{2}$  w. This we followed for about 9 miles, and encamped near a small water-hole in creek; no grass for the horses and cattle, except that growing on the banks of the creek, and not much there. Soil sandy and exceedingly poor, sandstone cropping up in creek.

Latitude  $16^{\circ} 26' 53''$ .



29th.—Cross the creek and travel about 9 miles s.w.  $\frac{1}{2}$  w. Level country densely timbered with tea-tree; no grass, and many conical ant-hills, about 3 feet high. Nearer the river the country opened, and finally after passing through a fringe of tea-tree saplings, bloodwood and stringy-bark, open forest fronting the river with plenty of grass and a prospect of improvement in the country. Stiff clay soil, sandstone cropping out here and there. Some box, acacias, and nondas. The banks of the river steep, water in many places.

30th.—Travelled about 11 miles w.x.w. along the north-east bank of the river, over narrow box-flats fronting the river with a background of tea-trees. The river-bed is 300 yards wide at 3 miles from last camp, and at about  $9\frac{1}{2}$  miles it is joined by the creek we left yesterday; plenty of water in the river. Encamped on its northern bank.

Dec. 1.—Continued travelling down the same side of the river, at a quarter of a mile from camp crossing a creek 150 yards wide; sandy bed, sandstone cropping up, two channels: it runs into the river from the N.E. by E. At 3 miles from last camp many lagoons have been filled by recent rains. At first the country presented the same desert-like and dry appearance that we have been accustomed to, but about the lagoons there was some short fresh grass. The banks of the river are in many places waterworn by floods, and spinifex grows on them. We encamped near the river, which is here one channel and one sheet of water 70 yards wide. Flood-marks 14 to 15 feet above the level of the water, or nearly to the top of the bank.

Latitude  $16^{\circ} 27' 26''$ .

2nd.—Continued our course down the river about 10 miles w.  $\frac{1}{2}$  s. The country becomes scrubby, and spinifex plentiful. Encamped near the river, which is 300 yards wide, plentifully timbered with melaleuca, and some sheets of water, scarcely drinkable. In the vicinity of the camp are some fine bloodwood and acacias, barringtonia, and rusty-gum.

For some time since I have been much puzzled to account for the large amount of westing we have been making, and now think that the Lynd and Mitchell rivers of Leichhardt must have been much to the eastward of us. The latitude of last camp  $16^{\circ} 27' 26''$ , together with my dead reckoning for longitude, places it about 40 miles from the coast. There is a broad sandy creek described by Leichhardt, nearer to the coast, and a little further south. I believe the river we are on to be the same, named at its mouth by the Dutch "The Staaten." We saw many ducks to-day in some water-holes near the river, and a few native companions.

3rd.—Travelled down the River Staaten, our journey being shortened to 6 miles west by a heavy thunderstorm from the westward. The country we came through to-day gradually assumed a

more cheerful aspect, being tolerably well grassed, watered by some fine lagoons, slightly undulating and openly timbered with large bloodwood, tea-tree, acacia, and box. Encamped about a quarter of a mile from the river, which here widens to 500 yards, sandy bed, water 30 yards, 2 feet deep at low tide, which rises and falls from 1 foot to 18 inches, easily fordable. The banks are low.

Latitude,  $16^{\circ} 26' 38''$ .

4th.—We remained in camp to-day until 4 o'clock; everything then packing up. We shifted camp about 2 miles W.X.W.; at  $1\frac{1}{2}$  mile crossing an ana-branch, and another near camp. Plenty of grass at this as well as our last camp.

The river has many ana-branches, and triodia in its bed. I had not time to go down to its mouth. Acacia, bloodwood, fig-tree (loaded with unripe fruit), and many others unknown to me.

5th.—Leave the Staaten, and travel about 12 miles N.  $\frac{1}{2}$  W. Much of the country we passed through is subject to inundation. In a shallow watercourse about  $2\frac{1}{2}$  miles from last camp, the flood-marks were as high as 6 feet. Encamped in a dry swamp—flood-marks 2 feet on the trees, no water, and very little grass. In the evening, one of the black boys came into camp, and reported having found water in a small lagoon about 2 miles distant.

6th.—One-half the horses missing. In the afternoon, packed up to shift the camp to the lagoon before mentioned. While packing, an accident occurred which at first sight would indicate great carelessness. We had with us a mule, a most useful animal—his pack one of the heaviest. Immediately on being packed he slipped off unperceived, which was the more easy, as the country was so densely timbered. He could not have been gone 10 minutes when his absence was discovered, and Sambo at once sent on his tracks; but the mule could travel faster than Sambo could track him, and we were obliged to give him up for that day. Our 38th camp was pitched in open box-forest, flat country, near a small lagoon, which held a little water quite green with vegetable matter. Two similar lagoons are in the same creek,  $1\frac{1}{2}$  mile up, and half-a-mile down, respectively. The soil is very hard and dry, but full of crab-holes; grasses poor and scanty.

12th.—All the horses but two (Lucifer and Deceiver)—the mule also—were found. Deceiver was found dead; Lucifer, mad, in consequence of excessive thirst, and drinking salt water. Sambo and Barny were out three days and nights tracking the mule, but were finally obliged to give him up. There are here box, bloodwood, acacia, sterculia, and nonda. Up to this time I have used  $6^{\circ}$  variation. Here the variation of the needle is  $4^{\circ}$  E.

Latitude  $16^{\circ} 13' 45''$ .

13th.—Left our 38th camp, and travelled about 12 miles north, over some small brackish plains, intersected by dry shallow water-courses, and changing with strips of tea-tree forest and scrub. At

8 miles from last camp we rested near a small creek running north-west, and holding a little water in holes, while Mr. F. Jardine, and his brother and Euler, went on a-head to seek water. Euler came back to us with the news and we continued our course, encamping on the north bank of Rocky Creek, which has much sandstone in its bed and plenty of water, and is no doubt a branch of the Rocky Creek mentioned by Leichhardt. The general appearance of the country seems to indicate that this has been a very dry season. We have strong westerly breezes during the day, falling off soon after sunset. Slight easterly winds spring up at midnight.

14th.—Travelled to-day about  $14\frac{1}{2}$  miles N.E.  $\frac{1}{2}$  E., slightly undulating country, timbered with tea-tree and occasional patches of box-forest or stringy-bark, bloodwood, and apple-gum; grasses slightly improving, but very dry. We were fortunate in finding a small lagoon directly in our course, in a small creek running w. by s. The floodmarks in this creek were nearly on a level with the adjacent country; but the bed is so irregular, no height above its level could be given.

Latitude  $15^{\circ} 56' 31''$ .

15th.—The country opened to-day immediately on leaving last camp, 3 miles of level, open, box-forest, grasses very dry, then passing through a narrow belt of scrub we came to broken sandstone ridges, and at about 4 miles from last camp crossed a deep creek nearly dry, 30 yards wide, running w. by n. The banks for several hundred yards on both sides much broken and rocky, with small ana-branches on its south side. Then came 17 miles of plains and patches of open forest-box, bloodwood, acacia, apple-gum, and baubinia; soil, hard clay, much cracked and dried up by heat, grasses on the plains very dry, in the patches of open forest sometimes fresh and green. This country is, I think, suitable for pastoral purposes, although we found the grass much dried and ground cracked by heat.

The horses having had a very long day at 19 miles, we unpacked near a dry swamp, and sent Euler on a-head to find water, having seen none since leaving the deep creek, and then a very little. He returned in about an hour with the welcome news, when we packed up, and shifted 2 miles further on to a small creek plentifully watered running w.N.W. Our general course was N.E. 21 miles.

Latitude  $15^{\circ} 45' 30''$ .

16th.—From the 13th camp it has been customary for us to travel in the following order: Messrs. F. and A. Jardine immediately after breakfast rode on a-head and found a camping-ground; the cattle then followed under the care of Binney and one or two black boys; the horses were then packed, and followed the rest in charge of Scrutton, Conderoy, and one or two black boys, generally passing the cattle at 5 or 6 miles from camp. I generally rode last of all, finding I could keep the courses and

distances better there than elsewhere. We had scarcely left camp this morning when we heard the report of fire-arms in front, and on riding up to a creek about a mile from camp, found that our leader and his brother had been attacked by some natives, whom they soon put to flight. The creek just mentioned held at the point of attack a deep sheet of water 20 yards broad. A little higher up we crossed it where the bed was dry. We travelled 5 or  $5\frac{1}{2}$  miles north-east, flat country, open forest, many shallow water-holes quite dry, grasses dense and much better than we had seen lately. Encamped on a deep creek running N.N.W., its bed in some parts densely timbered, the foliage rich and luxuriant, in others there are fine sheets of excellent water. Leichhardt's melaleuca, fan-leaved palm and fig-trees, some of the latter bearing ripe fruit, also vines and tropical trees unknown to me.

17th.—Crossed the ana-branch to-day, after cutting a passage through the vines, and travelled about 7 miles N.N.E., over box country much divided, and made very irregular by numerous small ana-branches all subject to inundation, drift in the trees and marks on the trunks of the box and flooded gum from 2 to 6 feet above the levels of the flats. At about  $4\frac{1}{2}$  miles from camp we crossed the main stream of the Mitchell River, bed 500 yards wide, sandy, and two channels, some water not running, banks low, and flood-marks above them; the foliage of the trees on both sides is very dense, and rich in various shades of green. The latter part of our journey bore some resemblance to a deserted garden which had contained many choice plants and trees, acacia, bauhinia, Leichhardt, and fan-leaved palm, the latter numerous, also cedar.

Encamped on a flooded gum-flat, grasses plentiful, fresh, and green, but rather coarse.

This country seemed well furnished with game—black, whistling, and Burdekin duck, Torres Strait pigeons, native companions, and many wallabies.

18th.—Travelled about 7 miles over a continuation of country subject to inundation in consequence of the overflow of the water of the Mitchell River. Our general course about N. by W.

About 5 miles from camp our leader with his brother met us, saying that a number of natives, 70 or 80, had disputed their passage (they were following the course of an ana-branch holding a sheet of running water 40 to 50 yards wide, endeavouring to find a crossing-place), throwing spears at them, some of which came unpleasantly close.

Our rifles and ammunition were soon in readiness, we could hear the natives coming up around us, when we advanced to the attack. Many of them lost the numbers of their mess, but no one of our party was hit.

A short time afterwards a crossing-place was found higher up

the stream, and we encamped on the north-east bank of a fine sheet of deep water, 70 yards wide, crossing near its north-west end, where the bed was of sandstone and above the level of the water. These ana-branches are all distinguished by a narrow belt of dense foliage.

The grass at our camp is very poor and coarse.

19th.—Travelled about 13 miles N.W. by N., leaving the river, and coming on to it again about an hour and a half before camping. Flood-marks 3 or 4 feet over most of the country we passed through, which is clothed with box, tea-tree, and mixed grasses, and has a slight inclination towards the river, whose banks are worn into perpendicular walls by floods. No water except in the river for 3 miles out.

20th.—Travelled to-day about 11 miles, for about 7 miles N.N.W., the surface of the land was much worn into hollows by floods, as the river here overflows its banks. The north-east bank is 20 feet high and precipitous. At about 7 miles from last camp we crossed a deep creek coming from the E.S.E., 70 yards wide; water 2 feet wide and running; the banks on both sides were a little scrubby. After leaving the creek, we travelled through box and bloodwood open forest, with occasional patches of tea-tree scrub and spinifex in sandstone washes. Wherever we find tea-tree, there the grasses become very poor and water scarce, except in large watersheds. Before reaching camp we were drenched by a thunderstorm from the north-west. The camping-ground is a bloodwood and stringy-bark ridge, not within sight of the river, some grass, not dense, and a little water in a gully to our left.

21st.—Heavy rains and much thunder and lightning during the night from the north-west. To-day the heat was very oppressive. Travelled about 10 miles W.N.W.; undulating open box-forest with small patches of tea-tree scrub; tea-tree away to the N.N.E. The grasses are fresh and green and tolerably good, and the country is suitable for pastoral purposes—should there be any extent of it. It appears to me, however, to end in tea-tree forest, and is possibly confined to the vicinity of the river. At about  $3\frac{1}{2}$  miles from last camp, crossed a shallow creek, 100 yards wide, sandstone cropping up in its bed; not running. Encamped near a lagoon, the river being distant from us about 1 mile W.S.W. The bed is sandy, a quarter of a mile wide, shallow water nearly all across, banks low; it comes from the S.E. by E., and runs W.N.W. From its appearance I should think that the bed extends still further to the southward.

Could not ascertain the rise and fall of the tide. Some small fan-leaved palms and mangrove-myrtle grow near its banks.

22nd—Just before sundown last night, our black boys reported that some natives were hovering about not far away, armed with

spears and watching our movements. In this instance it was thought better to carry the war into the enemy's camp than to have them throwing spears at us in the night. Most of our party went after them, and an exciting chase commenced, so close, that the natives were obliged to throw away their spears, two dozen of which were brought into camp. Some are made of reed, and others of hardwood, and most of them pointed with fish-bones. No one was hurt on either side.

To-day we left the River Mitchell, and travelled about 16 miles N.  $\frac{1}{2}$  W. Marine plains, poorly grassed and divided by patches of tea-tree forest, sometimes bloodwood, barringtonia, and acacia, or groves of the pandanus palm. Many melon-holes. We encamped on the north side of a small creek, which holds a little water; its course is N.W. by W.

As there was no grass, watches were set to keep the horses.

Latitude  $15^{\circ} 2' 30''$ .

23rd.—Travelled to day about 12 miles N.N.W.  $\frac{1}{2}$  N. Slightly undulating tea-tree forest, nothing but desert-grass. At about 7 miles from our last camp found a little water in a small creek running W.N.W. Encamped without water, and where the country was densely timbered with very little grass. Again watched the horses.

24th.—Travelled about 6 miles N.N.W., encamping on a bloodwood, stringy-bark low ridge, sandy, but fortunately a little grass. The poor horses are looking very thin and hungry.

25th.—Christmas Day.—Travelled N.N.W.  $\frac{1}{2}$  N., about 13 miles; country slightly undulating. Tea-tree forest, in some parts a little scrubby, in no part very open. Occasional patches of bloodwood and stringy-bark forest, in which we found a little grass. At  $6\frac{1}{2}$  miles from last camp crossed a creek, dry bed, running west, 150 yards wide. We have called it Balourgah Creek, that, I understand, being the native name for mahogany, its banks being lined with those trees. Encamped on the south side of a creek holding plenty of water in rocky holes; much ironstone in its bed. This we have named Christmas Creek.

26th.—Travelled to-day about 12 miles N.N.W.; country slightly undulating and a little improved. Bloodwood and stringy-bark on the ridges. Tea-tree in the hollows, sometimes scrubby and sometimes swampy, though now dry; a species of swamp-oak grows there. The soil is becoming more sandy. Encamped on the south-east side of a fine sheet of excellent water, 80 yards wide, in a creek running W.S.W. Mr. A. Jardine wishes it to be named Hersey Creek. Near the camp are acacia, bloodwood, stringy-bark, sterculia, banksia. We have rain now every day; not enough, however, to prevent our travelling. Indeed the rainy season seems to have set in.

27th.—Travelled to-day about 10 miles north. Bloodwood and stringy-bark more and tea-tree less frequent. Country slightly undulating. In the Bloodwood Forest there is some good grass—not much. Much underwood, and vines and creepers, nonda, and acacia. In the tea-tree country are some gigantic ant-hills, chiefly of a conical shape, many of them like sections of old mud-walls, from 10 to 20 feet high. Encamped in a tea-tree open flat, having found a little water in a small sandy creek near us.

28th.—Travelled to-day about 11 miles north, the first 5 miles slightly undulating. Bloodwood and stringy-bark on the rises, and tea-tree in the hollows; then crossing a dry creek 160 yards wide, sandstone in its bed, which was of several channels. The remaining 7 miles box-flats, which are more or less subject to inundation, and are also much divided by small watercourses and swamps. Crab and turtle shells strewed the ground. Pandanus, acacia, and rusty-gum. Encamped on a box-flat, the water in a small creek near us being brackish.

29th.—We had scarcely encamped yesterday before a heavy thunderstorm passed over us. The rain was a great boon, enabling us to fill our billies and cans with good water. It poured in torrents until midnight, and our tents not being waterproof we all passed an uncomfortable night.

We have hitherto been obliged to seek water near the coast, but as it is now to be found everywhere, we think of trying the interior. We accordingly travelled about 11 miles E.N.E.; at about 4 miles from camp came to a stream 40 yards wide, apparently deep water—tide rising—followed it up for  $1\frac{1}{2}$  mile where it rapidly diminished, and where we crossed it without difficulty. Box-flats along its southern bank on which were flood-marks 6 to 8 feet high, the grass being very rank and sedgy. The remaining  $5\frac{1}{2}$  miles undulating, poor, sandy soil at first, timbered with bloodwood and stringy-bark on the rises, and tea-tree in the hollows. The grasses on the low bloodwood ridges much improved. Encamped near a tea-tree swamp.

30th.—Remained in camp. Heavy rain again last night. I should have mentioned that while at our 54th camp, and during the rain, some natives were observed by our black boys who came running into camp with the news that they were frightening and driving the horses. As at our 47th camp a chase had answered our wishes in sending them away, it was thought best to do the same here, and the same result followed. The natives, however, did not go quite so readily in this instance.

31st.—Our general course to-day was about E.N.E.  $\frac{1}{2}$  E. 13 miles. At the distance of nearly 2 miles N.E. from camp—ridges tolerably well grassed, timbered with bloodwood and stringy-bark, we came to a creek—Kendall Creek—50 yards wide, steep banks,

and deep water all across. We saw it up for about 3 miles, and then crossed without unpacking. Continued our course through bloodwood and stringy-bark forest, alternating with tea-tree. When about 12 miles from camp, came to another creek—Sinclair Creek—25 yards wide, deep, and apparently permanent water. waterlilies; it was running W.N.W. We followed it up one mile, and encamped on the site of an old native camp. The tea-tree hollows we pass through are now, owing to the recent rains, becoming swamps, and also very boggy. The grass in them is always poor: occasionally honeysuckle is to be met with. 'The first creek mentioned to-day I have named "Kendall Creek;" where we crossed, the water was 3 feet deep, running. The second, whose bed is sandstone, and banks abrupt, but not deep, I have named "Sinclair Creek."

*January 1st, 1865.*—We were fortunate to find a crossing on Sinclair Creek, about one mile N.E. from camp, the water was there 3 feet deep, running, flood-marks 10 feet above the surface of the stream, which is beautifully clear. Our course was then N.E.  $\frac{1}{2}$  N., about 13 miles in all, undulating bloodwood and stringy-bark forest, commencing with a little tea-tree. At 2 miles from camp, near the top of the ridge, noticed grass-tree, at that point the grasses were rather poor. Finally, encamped on a small creek, only a few yards wide, very much like a cut channel, coming from the north-east, and running S by E.

The appearance of the country has totally changed, very much for the better, the grasses are good, though not very dense, leaving, we think, room for improvement, and the timber is finer. More than all, however, we are glad to be out of that tea-tree country, which has been as sore eyes to us ever since we left the River Einnasleigh. Near the camp are banksia, grevillea, bloodwood, and stringy-bark.

*2nd.*—Soon after arriving in camp a heavy thunderstorm passed over us from the north-east, which, towards evening, settled down into a steady rain, lasting until midnight.

Travelled to-day about 15 miles N.N.E., undulating country, the ridges being very wide and gently swelling: the soil firm, chocolate colour; the grasses good, and often dense; the timber chiefly bloodwood and stringy-bark forest, with much underwood and vines, sandstone cropping up in places. At about 11 miles from last camp the forest becomes dense, with a multitude of small bloodwood and stringy-bark saplings; and at 12 miles the ridge ended in a valley running north. A little further on came to a small creek near its head; here were banksia, pandanus, some young fan-leaved palms, and, round the edge of a small water-hole in the creek, ferns, the first we have met with. Following the creek down for about  $1\frac{1}{2}$  mile, we camped on the stony rising ground to the westward near a water-hole in the creek, which is elsewhere dry.



Near the camp are apple-gum, acacia, bloodwood, stringy-bark, and mahogany.

Latitude  $13^{\circ} 46' 46''$ .

3rd.—Travelled to-day about 16 miles, N.N.E.  $\frac{1}{2}$  N., undulating country, the soil changing several times soon after leaving camp, becoming light sandy, heavy travelling; and again before reaching the next camp, firm. The grasses varied both in density and quality.

At about  $3\frac{1}{2}$  miles from camp crossed a deep creek, running to the w.s.w., bed sandy, steep banks, small stream of good water running; dense foliage and vines on the banks. We have named this "Kinloch Creek." At about 7 and 12 miles respectively, we crossed two small creeks similar to cut channels, the immediate banks of which were boggy, in each a clear stream of good water. These small creeks, which probably have their source in springs, have a fringe more or less wide of banksia, and in them mahogany. The forest is chiefly bloodwood and stringy-bark, although at intervals we noticed a little iron-bark, zamia, pines, and grass-tree.

Latitude  $13^{\circ} 35' 54''$ .

4th.—We made a shorter stage to-day than usual—only 6 miles—N.  $\frac{1}{2}$  W., crossing a deep creek, 100 yards wide, and several ana-branches; bed sandy, with sandstone cropping up, water not running, but plentiful; dense foliage, and vines on the banks. Undulating bloodwood and stringy-bark as far as the creek, which is 5 miles from last camp; then box, rusty-gum, bloodwood; all open forest. Encamped, just in time to avoid a heavy shower of rain, near a small creek, or ana-branch of the last creek.

5th.—Travelled to-day about 14 miles, N. by E. The first 4 miles, stony ridges, tolerably well grassed; timbered with bloodwood and stringy bark; then, descending rather abruptly into a valley, at 5 miles crossed a river running, at that point, w. by s., 200 yards wide; dry, sandy bed, the banks from 7 to 10 feet above the level of the bed, and flood-marks 8 feet above the banks. I believe this river to be the same as that one named at its mouth the Coen by the Dutch. The banks are distinguished by a line of rich foliage. Mahogany, very fine; some large melaleuca also growing in the bed, the Leichhardt, and many other fine trees unknown to me. A box-flat, about one mile in width, with ana-branches, extended along the north side of the river; the intervening spaces covered with long, coarse, dense grasses and sweet-smelling herbs. Continuing our journey, at one mile from the river passed a fine sheet of water, deep and apparently permanent, in an ana-branch. The remaining part of the journey was performed over undulating gradually-ascending country, timbered chiefly with bloodwood and stringy-bark, not of large size, sometimes box, acacia, and rusty-gum.

At about  $12\frac{1}{2}$  miles from last camp I obtained a peep at the surrounding country, which is to the westward level, to the south-west a short, low range, or rather high ridge, runs north and south, to the north and north-east high ridges; but the general view gives an idea of flat country, not a prominent hill to be seen. Encamped near a small water-hole, in a creek or watercourse running S.S.E.

6th.—Travelled to-day about 16 miles due north. Undulating, open box-forest: some iron-bark, bloodwood, acacia, and *sterculia*. *Pandanus* everywhere common. Small deep creeks and heads of watercourses running to the north-west and W.N.W. At about 5 miles from camp saw a short range to the eastward, trending north and south, distant 6 or 7 miles. The grasses are excellent; indeed, all the undulating country we have passed through since leaving our 56th camp, should it be found to be well watered, may be said to be well adapted for pastoral purposes. It is to be noticed, however, that *we* see the country under its most favourable aspect. Encamped near the head of a watercourse, holding in a small water-hole a little water; the edges of the hole distinctly show a stiff yellow clay.

7th.—Travelled to-day about  $14\frac{1}{2}$  or 15 miles N.  $\frac{1}{2}$  E.; at  $1\frac{1}{2}$  mile from camp crossing a creek about 15 yards wide and 25 feet deep; clay bed, nearly dry, and not running. It comes from the south-east, and half a mile lower down is joined by a similar deep creek coming from the N.E. by E., which we also crossed, the banks of both being very steep and covered with dense luxuriant foliage. Mahogany, *Leichhardt*, *melaleuca*, and many vines and dense long grasses. The north bank of the latter creek was a high sandstone ridge. Then about 5 miles of level country, box and apple-gum; many hollows and melon-holes. The remaining portion of the day's journey was over slightly-undulating country: bloodwood and acacia, open forest occasionally, a little tea-tree, and once *banksia*, fan-leaved palm, not frequent, *pandanus* and box, grasses dense and good, ferns, wild flowers, and creepers and vines along the ground. Encamped on a small deep creek coming from the S.S.E. and running N.N.W.; not much water.

8th.—The rains continue every day, and the nights too cloudy to obtain the latitude. Fortunately, we seldom meet with very heavy travelling, the soil being firm, except in gum-flats. We are pushing very hard to reach the settlements before the floods. We travelled to-day about 18 miles, a little to the east of north. The first 6 miles undulating, open box and bloodwood forest, very pretty country; then one mile gum-flat. In these 7 miles there were many hollows and melon-holes. We then passed over some higher ridges, on which grow some fine iron-bark and bloodwood trees; here sandstone was cropping out. Latterly, undulating

open bloodwood and stringy-bark forest, changing with tea-tree and banksia, all tolerably well grassed. Encamped on a low ridge (near a tea-tree swamp), timbered with rusty and apple-gum, bloodwood, and acacia. It rains while I am writing.

Latitude  $12^{\circ} 38' 2''$ .

9th.—Travelled to-day about  $14\frac{1}{2}$  miles north, through undulating open bloodwood and stringy-bark forest, changing with tea-tree and banksia-swamps. At about 8 miles from camp crossed a large deep creek—"River Batavia"—coming from the S.E. by E., and running N.W. by W., 120 yards broad, sandy bed, 30 feet deep; water very clear and good, running about 2 feet deep.

The banks were covered with dense foliage and vine-scrub, in which grow some fine trees. The remaining distance bloodwood and stringy-bark, changing with tea-tree and banksia. Encamped near Tea-Tree Swamp.

10th.—Leave our 65th camp and travel about  $2\frac{1}{2}$  miles N.N.E.; soil very boggy after the heavy fall of rain. Ridges timbered with bloodwood and stringy-bark, hollows with bloodwood and gum. The cattle had preceded us, but many of them bogged when crossing a shallow watercourse—the gently sloping banks of which were very boggy—the water knee-deep, running N.N.W. After unpacking the horses we crossed them with some difficulty, and succeeded in getting all the cattle out but two—one a very fine fat bullock. These were killed, the former serving us with meat, and encamped on fine ground near the creek to cure what was not eaten, which was done by jerking it.

11th.—Continued our journey to-day in a N.N.E. direction; very heavy travelling. At about 2 miles from camp we came to a creek about 15 yards wide; water nearly bank and bank; current very strong, running to the N.W. by W. Crossed our packs and saddles and other things by felling a tree, which did not quite reach across, and obliged us to be very quick as the water was rising rapidly.

We then packed up and endeavoured to continue our course, but we had scarcely left the ridge forming the north-east bank of the creek when a heavy storm broke over us. We were now in a gum and bloodwood flat, and the ground soon ankle-deep in water; the clayey soil became boggy, and many of the horses sunk under their burdens and were unable to rise: one we were compelled to leave, as, after lifting her out of the bog, she was too weak to stand.

Returned to the ridge near the creek, and encamped about half a mile above the crossing-place.

Poisonous grass or herbs at this camp; cattle were not affected by it. We did not see the Flinders poisonous plant at any part of our journey.

12th.—Remained in camp to-day to dry everything. This morning two of our horses were found dead, Rasper and Marion, occasioned, we think, by poisonous grass or herb; and in the course of the day several other horses showed symptoms of being attacked by a similar disorder. Excessive sweat, blindness, and contraction of the stomach, and, I think, thirst, as all endeavoured to reach the water,

13th.—This morning discovered four more horses dead. Our horses were now twenty in number, so that we were reduced to the necessity of walking. So, ridding the packs of as much useless lumber as possible, we packed all the horses and proceeded on foot. It was found necessary that one should ride with the cattle, that being Binney's duty. We walked through bloodwood and stringy-bark forests, intersected by tea-tree and pandanus watercourses: in these the horses frequently bogged; so much was this the case on coming to a gum-flat that we were compelled to unpack everything and carry the packs and saddles to a low ridge, having travelled about  $9\frac{1}{2}$  N.E. by N. While travelling another good packhorse died, and shortly after reaching camp another.

14th.—Walked to-day about 7 miles N.E. by N.; undulating country, intersected by small watercourses full of water, and running generally about south-east. Sandstone cropped up on the ridges, which are timbered with bloodwood, iron-bark, apple-gum, and pomegranate. Some zyamia, and the ground is everywhere covered with ferns, and, near the watercourses, mosses. The grasses are good, but not dense. The grasses in this country are generally known as blue and Isaac's grass. The hollows are boggy, and the timber generally met with in them is bloodwood, tea-tree, gum, and pandanus.

15th.—We had a very heavy storm yesterday afternoon, commencing a little after midday and raining for three hours. The hardest rain we have had. Remained in camp to-day to dry our belongings. The rain had scarcely ceased when some fifteen or twenty natives came near the camp. They were unarmed, made a great noise, and talked, gesticulating vehemently. They would not allow us to come near,—that is, on our approach they retreated, and finally, getting their spears, came up with the intention of attacking us. Two shots only were fired; some of our party then chased them, the natives, however, soon outrunning everybody. They use the wommerah to throw their spears, which are pointed with fishbone; the shaft being made of hardwood.

16th.—Leave our 69th camp and walk about  $15\frac{1}{2}$  miles N. by E., walking over some high ridges, or one might almost say low ranges; there does not appear to be a distinct range, merely a succession of gradually-ascending ridges, which are not well grassed. The forest is not open: bloodwood and stringy-bark,

apple-gum, grevillea, young pandanus, and zamia. At about 5 miles from camp we descended gradually into a valley and crossed, the horses bogging a little; a smaller stream of excellent water running to the west. A little further on a deeper creek, bed sandy and firm, water also running knee-deep in the same direction. On the north bank of this creek, which formed the slope of a high ridge, were growing box, stringy-bark, apple-gum, bloodwood, and acacia. The creek itself is probably one of the heads of the River Batavia.

About  $5\frac{1}{2}$  or 6 miles beyond this point we came to a deep creek with steep banks, the water running slowly to the w. by n. We found a shallow crossing, and passed over without difficulty; flood-marks 20 feet above the bed. On the banks grow vines, melaleuca, and mahogany.

Next passing over a bloodwood and stringy-bark ridge; many vines, much underwood, and little grass. We encamped on the north side of a deep creek, 10 yards wide, water knee-deep, and running slowly to the westward; banks steep, and timbered with gigantic melaleuca, mahogany, seaforthia, palm, fruit, and other trees unknown to me.

17th.—Walked to-day about  $15\frac{1}{2}$  miles north; at  $2\frac{1}{2}$  miles from camp crossing a deep creek, banks steep, water knee-deep, running south-west, sandstone in its bed. At  $4\frac{1}{2}$  miles from camp reached the top of a low range, heading s.w. by w. Our ascent commenced with the day's journey. Some of these ridges are stony, with poor grass; and some sandy, with much underwood and vines, making walking laborious; passed some gigantic ant-hills of bright red earth, the colour sometimes approaching vermilion, 25 to 30 feet high. The timber chiefly bloodwood and stringy-bark, with grevillea, and occasionally apple-gum. At about  $8\frac{1}{2}$  miles from camp crossed a small creek running to the westward, flood-marks not high; and at  $10\frac{1}{2}$  miles descended into a valley. From this point we saw a low range to the north-east, distant about 5 or 6 miles, heading apparently south-east and north-west. Encamped on the north-east bank of a shallow creek; clear excellent water running to the north-west. During the latter part of our walk the soil became more loose and sandy, ending at the descent into the valley in white sand, poor grass, banksia; near the creek, pandanus, and a palm-tree, whose leaf is like a star, radiating naturally from the stem, and not split by the wind. While travelling, another horse died.

18th.—We found two other horses had died this morning from the effects of the poison—whatever it may be—which they had taken at the 67th camp. These poor brutes foamed very much at the mouth, and were continually walking round until they dropped. Our horses now numbered fifteen, and we were obliged to throw

away two empty saddles. Walked to-day about  $11\frac{1}{2}$  miles N.N.E., crossing several high ridges, trending generally N.W. by W., the creeks and watercourses between them being deep and narrow; some of the ridges were scrubby, all densely clothed with underwood and vines wherever stringy-bark was seen; all also either very poorly grassed or barren. Eleven miles from camp the top of the ridge was free from trees, and for ten miles to the northward nothing but brushwood to be seen. Encamped near a deep creek in a ravine running generally W.S.W.; water excellent. We passed to-day a great deal of banksia and grass-tree; in the creeks, were mahogany, pandanus, tea-tree, and the star-leaved palm.

Latitude  $11^{\circ} 46' 36''$ .

19th.—Walked to-day about 8 miles N.N.E.  $\frac{1}{2}$  E., crossing many gullies, in every one of them a stream of clear sparkling water, cool and excellent. No trees, with the exception of stunted banksia, except in the ravines; brushwood in white sand, no grass. At about  $5\frac{1}{2}$  miles from camp entered a bloodwood and stringy-bark forest, very dense underwood, and vines; a mile further on more open. Encamped near a rivulet running N.E. By climbing a tree to the eastward, on the top of the ridge, I saw the coast-line to the east and south-east, distant about 10 miles. The country lying between us and the sea appears to be flat and covered with brushwood. The coast-line is marked by white sand-hills. There is some grass, not by any means dense, in the neighbourhood of the camp. With regard to the small streams of running water near the top of the range, their banks were in all instances boggy and covered with mosses and ferns.

20th.—On leaving camp to-day we endeavoured to travel north, but were foiled at 2 miles from camp by a dense impenetrable scrub; returning towards our yesterday's camp about half a mile, then about half a mile east, to the eastern slope of the range. At this point the sea was distinctly visible: a bay to the south-east, the projecting point of land bearing S.S.E.—Cape Grenville, probably. It is difficult to tell the trending of the Richardson Range. To the northward it appears to be N.N.E.; to the southward its outline cannot be seen. Continuing our course down a spur of the range, which is very stony (ironstone), we encamped near a small creek, running water, to the eastward. The course of the stream is marked by a line of small trees and dense foliage. From a point on the spur of the range, near the camp, I got the prismatic bearing of Cape Grenville,  $117^{\circ}$ .

21st.—The grass was good at the camp we left to-day, and was much needed by the horses and cattle. We walked to-day  $7\frac{1}{2}$  miles N.N.E. in about  $6\frac{1}{2}$  hours, crossing four deep and narrow creeks running generally east, and between them spurs of the coast

range, or rather dividing range. Every one of these creeks is full of dense vine-scrub, and through which we were obliged to cut a path. The scrub in some places quite impenetrable. One vine in particular, the long fine tendrils of which were covered with hooked thorns, was most annoying. The foliage of the trees, which are tall, has a very tropical appearance; some fruit-trees, sea-forthia, and star-leaved palm. The spurs of the range are either stony or of white sand: in the former instance not badly grassed, in the latter without grass and covered with brushwood, mahogany, banksia, pandanus frequent, tea-tree occasionally.

22nd.—Walked to-day about 10 miles north. About 2 miles from camp, I ascended a bluff spur of the range, and saw the sea quite plainly at about 8 miles distant; to the north a short range trending east and west, distant from 14 to 18 miles. All the country we can see from this point, included between the north and south-east points, appears to be either scrubby or covered with brushwood.

We had only to cut paths through four or five creeks to-day, and at about 4 miles were off the range, which tails out towards the north-west very gradually. The soil is white sand, and grass rare; forest country, with dense underwood alternating with more open ridges, covered with brushwood or grass-tree, banksia, pandanus. We were twice pushed out of our course to the westward by dense pine-scrubs. Water is plentiful; every creek on this side of the range has a stream of cool, clear, running water in it. Encamped amidst some open brushwood near a small creek running east; rocky bed; not in time to avoid a heavy shower of rain from the eastward.

23rd.—Walked to-day about  $9\frac{1}{2}$  miles N.W. by N.; fewer creeks, otherwise the country is similar to that of yesterday. Some of the underwood very dense and difficult to walk through; grass-trees very plentiful. Pine-scrub to our right, at about 5 miles from camp, stretching away to the eastward. At about 9 miles from last camp emerged out of some very dense brushwood into undulating forest, with grass enough for a camp. We therefore pitched our tents near a tea-tree watercourse, similar to those we saw on the western watershed. We passed to-day pines, mahogany, a species of oak, rough-leaved fig, and other tropical trees. Many ferns and mosses in the creeks.

24th.—Walked to-day about  $4\frac{1}{2}$  miles north. At  $3\frac{1}{2}$  miles from camp came to a creek 10 yards wide, 8 to 10 feet deep, banks abrupt, bed of white sand, water 2 feet deep, running. Soon after skirting this creek, which runs N. by W., the country—which had previously been scrubby or covered with brushwood—improved. The soil—before white sand—became richer, and of a chocolate colour; the grass dense and good. While travelling a

very heavy thunderstorm caused the creeks to rise very rapidly, preventing us from continuing our journey.

25th.—Walked about 10 miles N. 16° W., crossing several deep and narrow creeks, each distinguished by a dense vine-scrub. At 3 miles from camp the soil again changed to white sand; and again we walked through heath, brushwood, and scrub, the latter part of the day's journey being performed in heavy rain. Encamped on a gently-sloping sandy ridge, timbered by a few stunted trees—banksia, grass-tree, and pandanus; not much grass either for horses or cattle. A small watercourse to the southward, and near the camp, runs eastward.

26th.—Leave our 79th camp and travel about 10½ or 11 miles N.W. by W., at 1½ mile from camp, coming to and following the course of the River Jardine, which, I think, is the Escape. It enlarges very rapidly, many creeks coming into it from the southward; the north-east bank is lined for several miles by a dense scrub, the south-west bank being densely timbered—oaks, tea-tree, heath and brushwood; in some places much underwood and pandanus. Walking is tedious and difficult. We all suffer from sore feet. Various methods are tried to walk comfortably; some have boots, some are barefooted, others use pieces of blanket; then again a kind of sandal was invented, and found to answer very well. Although much hindered by the scrubby creeks, we endeavour to push on, in rain or sunshine. Encamped on a large stream, 40 to 50 yards wide, coming from the S.W. by S., and joining the river half a mile below our camp. The river is here 60 yards wide, swollen by the recent rains, although yet 8 feet below the top of the banks, which are very irregular, and broken by small tea-tree creeks coming in from the S.S.W.

27th.—Found a shallow crossing-place of the creek, near which we encamped, and were able to carry everything over safely, swimming the horses and cattle. We then continued our course about 5 miles north-west, through country partly scrubby, partly forest, tolerably well grassed. The ground everywhere much covered by vines, shrubs, and herbs. Crossed two scrubby creeks near their junction with the river. Higher up the scrub continued for a mile beyond these creeks. Encamped near the river on the south bank of a narrow deep creek coming from the N.W. by W. The river widens rapidly, being here 100 yards wide, banks abrupt, and not heavily timbered. The vine creeks we have crossed have in their scrubs many wild and some luscious-looking fruits, many eatable and good. These would no doubt improve with cultivation. More game is to be found here than we have seen for a long time; kangaroo, wallaby, scrub and plain turkeys, pheasants, black cockatoos, parrots, and many pigeons.

28th.—Our course to-day was very winding, generally about



n.w. by w., distance about 12 miles. The river ran very much to the eastward, and had a very scrubby frontage to its north-west bank. About 3 miles from camp we came to an open heath extending to the north-east, the country being still a succession of ridges, some of which are tolerably well grassed; on others there is much underwood, sometimes heath and brushwood. It may be said in a general way of the country we have seen on the east coast, that it is composed of sandy ridges, not often grassed, but clothed with heath and brushwood, or scrubby.

The rains are heavy, and commenced always about mid-day, the nights being now fine and clear. This day's journey seemed to be very heavy for the horses, several of them knocked up on the road and were left behind.

Encamped near the river, the last  $1\frac{1}{2}$  mile of the journey being more open. It is the stated intention of the leader to wait here a week to rest ourselves, as well as the cattle and horses.

30th.—Mr. Frank Jardine, his brother, and Euler leave us, and go on ahead to find the settlement. My dead reckoning places our present camp about 19 miles south from Somerset, and 8 miles from the mouth of the Escape River, as shown in the tracing.

Feb. 2nd.—Our leader returns. His report is as follows:—“He followed the river down, having travelled 30 miles west and 20 miles north. He then turned back, believing it to be the western waters. The river, whose width is here 100 yards, he tells us is 300 yards wide; 30 miles lower down another branch coming in from the southward, that the main stream makes a great bend to the west and south-west, in one place running s.s.e. He would not be surprised if it is the Batavia.” This proves at any rate that my estimated distances are incorrect, that is, since we have been obliged to walk.\* This is not to be wondered at when it is remembered that we have had a difficult country to walk through, that our stoppages were frequent in consequence of the horses bogging and being dragged out, having also to cut roads through most of the scrubby creeks in our way. I do not think the error in latitude more than 15 miles. For many camps I have been unable to obtain the latitude. The sextant has been shaken out of adjustment or the run injured, and no opportunity has yet offered of putting it into order. We do not see the sun, both days and nights being now rainy—not heavy rain, but continuous. The river has not risen more than 1 foot since we have been encamped here; at its lowest, the depth of water above the level of the bed was about 5 feet. It is now rising rapidly.

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\* I afterwards found that these distances were incorrect, the true distances west and north respectively from the 82nd camp to the point in our track, where the leader turned back, are about 24 w. and 7 n.

5th.—On the night of the 4th I was enabled to obtain the true latitude of this camp, having previously adjusted the sextant as well as possible. I found the plate at the back of the horizon-glass broken. Latitude 8<sup>2nd</sup> camp, 11° 11' 39", or about 33 miles south of Cape York—probably 26 miles south of the settlement. Mr. F. Jardine, his brother, and Euler cross the river, and again leave us to seek the settlement. We expect to see them on Saturday or Sunday next.

6th.—A most lovely, clear, fine day. We hope the weather is breaking.

7th.—Heavy thunderstorm from the N.W.

8th, 9th, and 10th.—Fine days, thundering a little in the afternoon; the river going down rapidly; the bed is sandy, many snags, and the banks abrupt, not deeper than 15 to 20 feet, lined with melaleuca and mahogany. The immediate frontage to the river, say 200 to 300 yards, is more or less well grassed and timbered, with nonda, bloodwood, and tea-tree. To the westward, beyond that distance, the country is undulating, white sandy soil, no grass, partly open heath, with banksia, brushwood, and pandanus, partly scrubby, and appears to be the same as far as one can see. I am told by one of the party, a native of Sydney, that this country and that in the neighbourhood of Sydney are exactly similar.

11th.—Our leader returns a second time unsuccessful; he tells me that he proceeded in a direct line N.N.E., intending to strike the coast and follow its bends until he reached the settlement. He was on the coast near the mouth of the Escape River; saw Newcastle Bay and Mount Bemer; could not cross the river, so many mangroves—so much mud and other disagreeable things. He further says that the river is more than one mile wide at the mouth, from which point he followed it up towards its source for 53 miles,\* it was there 500 yards wide, unapproachable by reason of mangroves and mud. Their horses knocked up the second day after they left us, and they were obliged, they tell us, to walk back, after being almost within sight of the place of our destination. They describe the country as wretched, compared with which that we have passed through was a paradise—that we know was bad enough. They found nothing but scrub and brushwood—no grass whatever—near the coast mangroves *ad libitum*.

Our opinions are now changed; there is no doubt that the river, near which we are encamped, is the Escape, and our best plan is to follow it until it bends to the eastward.

All our provisions are now gone with the exception of 10 lbs. of

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\* I see in the account of Mr. Kennedy's expedition the Escape River is about 16 or 17 miles long.

flour. The sugar lasted up to this camp. Most of the tea was burnt at the 16th camp, the remnant that was saved there would have lasted some time with care, but even that was lost with the mule at the 37th camp; from that point we boiled the sugar and water together and drank it instead of tea. Now we are reduced to jerked meat and water.

14th.—It was finally resolved to continue our journey down the river as far as the head of the tide. The horses are looking wretched, and are evidently almost worn out. we are therefore obliged to leave several packsaddles and other rubbish. Walked about  $8\frac{1}{2}$  or 9 miles W.N.W. The course of the river is very tortuous, the banks from 10 to 12 feet average height above the surface of the stream, which is quite free from fallen trees, although an occasional snag is seen in the shallows. Tea-tree swamps run parallel with, and are only divided from, the river by its bank. The country is nowhere open nor well grassed, sometimes scrubby, often much underwood and brushwood. Floodmarks 10 to 12 feet above the water. Encamped on the river-bank.

15th.—Walked about 7 miles W. by N., leaving the river-bank at about one mile from camp to avoid a scrub, and travelling through country very poorly grassed—banksia, heath, and brushwood—undulating white sandy soil, not boggy, although recent heavy rains have made it very wet. Near the river the soil is sometimes much richer, and there are occasional patches of better grass. The river timber is melaleuca, and mahogany, white bloodwood, nonda, tea-tree, grow in its immediate neighbourhood. Encamped on the bank of a creek, 15 yards wide, immediately after crossing it near its junction with the river. It has a sandy bed, water running 2 feet deep—banks abrupt, but not deep.

16th.—Continued our journey from camp 84, walking about  $9\frac{1}{2}$  miles west. The whole river frontage is not by any means open; yet we were compelled to follow its windings—so many swamps run parallel with it, sometimes forming a permanent lagoon, and sometimes running into the river by a shallow gully. At 8 miles from camp, crossed a large creek 30 yards wide, sandy bed, sandstone cropping up. We unpacked, and carried everything over at the shallowest place we could find, where the water was running beautifully clear, five feet deep. At some points the ground is covered by dense grass and vines, bloodwood, nonda, mahogany, tree-tea, and banksia. Encamped on the river-bank.

17th.—Walked to-day about  $8\frac{1}{2}$  miles W.N.W., keeping close to the river for about 5 miles, when a boggy swamp obliged us to leave the river-bank. It was at this point that our leader and his brother turned back, concluding that this river ran into the west coast, without having seen anything definite. As before mentioned, they told me, they had travelled 20 miles north, and 30

miles west—a glance at the map will show this to have been an error. The next three miles we walked through wretched country, heath and brushwood, banksia and scrub, pandanus frequent. Our path was about one mile from the river from which we were separated by a densely-timbered swamp. The last half-mile following a ridge which brought us down to the river, and better grass, this being a good camp for the horses and cattle.

The river here overflows its banks, more particularly the north-eastern one, during floods.

18th.—Walked to-day about 9 miles north, almost at starting we crossed a creek 15 yards wide, water running 6 feet deep; its bed is sandy, sandstone cropping up, and it comes apparently from the southward.

After crossing the creek, we continued travelling near the river, having a high ridge, timbered with bloodwood and stringy-bark, on our left hand; it was also clothed with many vines and much underwood, and extended for one mile due north. After this, the features of the country were similar to those previously mentioned—a mixture of swamp and scrub, brushwood and underwood. Encamped quite close to the river, whose waters appear to be affected by the tide—a slight rise and fall being perceptible at intervals. We have been expecting the river to turn to the eastward latterly, and are somewhat doubtful, now, where it will run. My dead reckoning places our present (the 87th) camp about 7 or 8 miles from the coast, and 32 miles, in a direct line s.w. by w., from the settlement.

20th.—After staying at the 87th camp to kill and jerk some beef, we continued our journey to-day, walking about 6 miles north-west. The swamps became less frequent, and the grass improved. We were much disappointed to find the river turning to the westward, being finally brought to a standstill by a creek 15 yards wide, coming apparently from the south. Here we see mangroves and a tidal mark, showing a rise and fall of 3 feet; here we encamped. From the top of a ridge on the other or western side of the creek, one of the Jardines, by climbing a tree, saw the mouth of the river, at the distance of 2 miles. He tells me he saw Prince of Wales Island quite distinctly, and that the river-mouth is one mile wide. This is conclusive, and we must now retrace our steps and cross the river. Had not our horses been in so low a condition—some of them being scarcely able to walk—some one would have gone a-head and prevented the whole party travelling so far out of its course.

Latitude  $10^{\circ} 56' 14''$ .

21st.—Returned to the 87th camp.

23rd.—Heavy rains; the river rising rapidly.

Mr. F. Jardine and his brother, with Euler, swam across the

river, taking with them 5 horses, and start on another excursion to find the settlement.

24th to 28th.—Heavy rains continuing night and day almost without intermission. River has risen to within one foot of the top of the bank at camp, having overflowed its banks in many places, both up and down the river.

March 1st.—Shifted camp on to a low ridge about one mile down the river. Rains cease. One of the weak horses, Lady Scott, died.

5th.—The Messrs. Jardine return with good news. They had no difficulty in finding Somerset, having met with two of the blacks, who guided them. They tell us they accomplished the distance in from 35 to 37 miles. Every one very glad to see them, as we were beginning to feel the effects of living on jerked meat and water.

7th.—Made a punt by covering a frame with bullock-hide, and crossed everything dry but the last load, which consisted of pack-saddles. Encamped on the east bank of the river, which had fallen 7 feet.

8th.—Leave our last camp in much better spirits than we have enjoyed latterly, walked about 10 miles N.E. by E. The first 3 miles a mixture of swamp, brushwood, and heath, white sandy soil, banksia, and tea-tree. Then 7 miles undulating country, the ridges of chocolate-coloured soil, grass tolerably good, vines and underwood, timbered with bloodwood and stringy-bark.

In the valleys the soil is white sand, grasses poor, banksia and tea-tree. About  $4\frac{1}{2}$  miles from last camp we unpacked everything and crossed a creek 6 yards wide, running 5 feet deep, coming from the south; bed, level, of sandstone; banks low and abrupt. On crossing the creek, one of the weak horses could not stand, and we were obliged to leave him to his fate. Had not five horses in good condition been brought out from the settlement, we must have left most of our goods and chattels behind.

9th.—Walked to-day about 9 miles N.E. by E. High ridges tolerably well grassed, and crowded with dense vine-scrubs. Swamps in the hollows, sometimes hidden by dense brushwood. Water everywhere plentiful.

Encamped on the south-eastern slope of a well-grassed ridge, having a swamp beneath, and a small vine-scrub above us.

10th.—Some natives came to the camp during the morning, and were sent away to bring some fish in exchange for tobacco. Five of them returned in the evening, each bringing his supply of shell-fish, receiving some tobacco, of which they are all very fond, in return. They smoked the leaf by inhaling a long draught from a piece of bamboo, which is previously filled by means of a tube made of a large green leaf in which a leaf of the weed is rolled,

lit, and the smoke blown into the bamboo. This singular method of smoking had great effect on them, making them very stupid.

11th.—Walked  $7\frac{1}{2}$  or 8 miles N.E. by N. Undulating country, bloodwood and stringy-bark, moderately well grassed—sometimes vines, underwood, and ferns, occasionally scrubby. Encamped on the slope of a ridge overlooking a small lake to the southward, its native name is Chapegwynya, pronounced ass pelt. Alligators have been seen in the lake. Noticed nonda, Moreton Bay ash, tea-tree, and mahogany. Passed many old native camps, the ground being covered with shells.

12th.—Walked to-day about  $7\frac{1}{2}$  miles north-east; alternately scrubby and open forest, high ridges timbered chiefly with bloodwood, tolerably well grassed. In the valleys, white sandy soil, tea-tree and banksia, and poor grasses; water everywhere plentiful. At about 4 miles from camp we rested on the north bank of a larger lake than Chapegwynya, named Boronto. Here Mr. Jardine met us. He had just ridden out from Somerset. He had selected a good camp near the coast, about two miles from Somerset, at Vallack Point, which we reached in the evening.

The scrubs abound with turkeys and wallabies, and occasionally megapodii are met with.

The site of the town of Somerset seems to be admirably selected on the south-west side of a channel, averaging perhaps 800 yards width, which divides Albany Island from the main land. The coast-line is very irregular. Ridges, 100 to 150 feet above the sea-level, end abruptly in the channel, separating small sandy or muddy bays; the shore of Albany Island also presenting similar indentations and projections. The ridges are generally clothed with scrub, although on the south-east side of the town the slopes are bald. The land between the ridges slopes down gently to the beach of each bay, being in some instances more openly timbered. Small fresh-water streams or rivulets find their way slowly to the sea. Good water is also to be found by digging a few feet deep in the hollows. The soil is very poor white sand, although vines and shrubs grow very luxuriantly in the scrubs which cover much of the neighbouring country. On the ridges the soil is very thin, ironstone frequently cropping out. Sandstone, too, is laid bare, by the weather and time, immediately above high-water mark. The views are picturesque from any point, and are a great relief to the eye after travelling for five months through nothing but forest.

III.—*A Boat-Voyage along the Coast-Lakes of East Madagascar.*

By CAPTAIN W. ROOKE, R.A., F.R.G.S.

*Read, December 11, 1865.*

IN the latter part of March, 1864, I met at Port Louis, Mauritius, a gentleman of the name of Plant, whose acquaintance I had made the previous year in Madagascar, where he was collecting specimens of Natural History, and he communicated to me his belief that the chain of lakes which commences about nine miles from Tamatave, and is visible at intervals from the track leading thence to the town of Andivorante, might be traversed for several hundred miles in a boat of light draught, which could be carried over the short distances of land that here and there separate one lake from another. He expressed his willingness to accompany me on an expedition to explore these lakes from end to end, and two officers of the garrison at Port Louis, Captain Johnston, 24th Regiment, and Mr. Hewitt, Assistant Superintendent of Stores, having joined us, we commenced our preparations at once, as the least unhealthy time of year in Madagascar commences about the end of April, and does not last much longer than three months.

Our chief object was to construct a boat sufficiently large to contain our party of four, with all our provisions and stores, together with a crew of eight men, and at the same time so light that the eight men should be able to carry her, if necessary, 8 or 10 miles. It was also indispensable that she should be a tolerably good sea-boat, as on those large fresh-water lakes a strong breeze soon raises a high short sea, which has often proved fatal to the natives in their frail canoes, and, indeed, on one occasion caused us to run for shelter.

The boat which we caused to be constructed to meet all these requirements was 18 feet long and 6 feet beam, with a very flat midship section, sharp ends, and no keel; she was strongly built of white pine, with American oak timbers, and fitted with a lug-sail, an awning, and four 13-foot oars, presenting, when in the water, the appearance of a short, broad whale-boat. Her draught of water when empty was about 4 inches, and with her crew and stores on board never exceeded a foot. She was commenced on the 4th April, and on the 17th was embarked, together with our party, on board a trading steamer bound for Tamatave, Madagascar, at which port we arrived on 21st.

On the 24th April our boat was carried overland to Ivondrou, a village 9 miles from Tamatave, and where the chain of lakes first commences. King Radama I., the father of the unfortunate sovereign who was murdered in May, 1863, had commenced a

canal connecting the lake at Ivondrou with the Port of Tamatave, but it was discontinued on his death, which happened in 1828.

At sunrise on the 27th April, everything being complete, we started on our journey, our crew consisting of a negro who spoke English and Malagash, and seven Marmites, ordinary labourers of the country, one of whom was a pretty good cook. They were none of them very expert with the oars, so were accommodated with paddles, with which, in smooth water, they propelled the boat on an average something over 4 miles an hour, their method both of shaping and using their paddles being almost exactly the same as employed by the Maories on the Waikato River, New Zealand, as I observed during a recent visit to that colony.

One of the greatest difficulties with which we had to contend during our trip, and which, in fact, brought us to a standstill for a short time soon after we started, was the number of stakes stuck for fishing purposes into the narrower and shallower portions of the lake, some of which were broken off just below the surface, rendering it almost impossible to perceive them, while at the same time they were composed of such hard wood that if we struck them when going at any pace they could not fail to penetrate the deal planks of our boat; we several times, after coming into collision with one of them, had to run the boat ashore, taking everything out of her, and stopping the leak before proceeding on our way.

After leaving Ivondrou we first crossed an arm of the sea, about half a mile wide, and then struck into a deep channel varying in breadth from 10 to 100 yards, with the banks on each side covered with most luxuriant vegetation, along which we proceeded against a slight current for about 12 miles, and then stopped for a short time at a village containing some ten or twelve houses, built on a piece of rising ground on the right bank of the stream, soon after leaving which we emerged on a large lake, "Nossi bé," about 20 miles long by 15 broad, which we traversed lengthways against a strong wind and heavy head sea, taking up our quarters for the night in a collection of two or three houses, situated on the opposite side of the lake. The next day about noon we quitted our quarters, in the vicinity of which were several natives collecting gum copal, and passing out of Lake Nossi bé we entered in succession two smaller lakes, each about 5 or 6 miles in diameter, with thickly wooded shores. After crossing the last of these we had to take the boat out of the water and carry her, together with all our baggage, for half a mile to a small piece of water about half a mile long, after traversing which we had again to carry the boat for 50 yards across a strip of sand, and then launched her on a sheet of water varying in breadth from half a mile to 100 yards. Along this channel we paddled for 25 miles through beautiful park-like scenery, stopping on our way at two villages; the first of which,



situated about 3 miles from the spot where we entered the lake, consisted of one long street, and contained some 300 or 400 inhabitants, the other about 10 miles further on, and called "Adankodret," was much smaller, and though situated near the border of the lake was not above a quarter of a mile from the sea. On the afternoon of the 29th April the lake, after getting shallower and shallower, stopped altogether, so we remained for the night at a small village consisting of about a dozen houses, situated at the head of the lake, and the boat was next morning carried half a mile through the woods and launched on a lake about 2 miles long and a mile broad. We passed through this and entered another and much larger lake, where we encountered such a strong head-wind and heavy sea that we were obliged to run the boat ashore on a strip of sand. The shores of the lake were thickly wooded, the trees growing (except at the small sandy beach where we landed) right down to the water's edge, the waves, which during the continuance of the storm rose to a height of 7 or 8 feet, breaking in among the trunks of the trees.

Next morning we resumed our journey, and having crossed the lake (a distance of about 5 miles) we found ourselves in a deep channel about 50 yards wide, running between banks of green turf studded with clumps of trees. Along this we paddled for 10 miles, passing on our way two good-sized villages, opposite one another, near the entrance of the channel, and then arrived at a village consisting of about a dozen houses, where, as it was then necessary to take out the boat and carry it  $1\frac{1}{2}$  mile through the woods, we remained for the night.

We launched our boat next morning in a swift running stream, barely wide enough to admit of our passage, the boughs of trees thickly interlacing overhead; down this we pursued our course for about 3 miles, and then entered a river some 10 yards broad, bordered by trees and water-plants, along which 12 miles' paddling with a gentle current in our favour brought us at noon, on May 2nd, to the town of Andivorante, situated on the sea-coast about 60 miles south of Tanatave, and where the route from that port to the capital, quitting the sea-shore, strikes inland.

During this portion of the journey the eastern banks of the lakes were never more than 10 miles from the sea, and frequently within a few hundred yards of high-water mark. We had passed over, according to our reckoning, 104 miles since we quitted Ivondrou, of which the boat had only been carried overland  $2\frac{1}{2}$  miles. Between Ivondrou and Lake Nossi bé we had the current against us, and for the last 15 miles before reaching Andivorante (where there is an outlet for the fresh water) we had the current in our favour while the intermediate water was perfectly tideless. The inhabitants of the different villages through which we passed

were nearly all of the Petsimasaraka race, although here and there were a few Hovas whom the former treated with great deference.

We quitted Andivorante on the 3rd May, and after paddling 3 miles across a lake entered a shallow stream about 5 yards wide running over a sandy bottom, where the current against us was so strong that we had to get out and drag the boat along. The country on each side of us was wet swamp. After about 4 miles of this we came out on a large but shallow lake about  $1\frac{1}{2}$  mile wide, with thickly-wooded shores, which we traversed for 5 miles, sometimes having to get out and push the boat through the mud, and then stopped for the night at a small wooden house, the property of the Governor of Tamatave. It is built on a high promontory, and about a quarter of a mile distant from a very small village.

I was seized here with violent shivering, and attributed it to a simple cold, as we had had a good deal of rain lately; it, however, turned out to be the precursor of a Madagascar fever, which caused me a good deal of inconvenience during the trip, and from which it was several months before I finally recovered.

We started again next morning, and after 2 miles more paddling and pushing through the mud we came to a small village of half-a-dozen houses, where the lake ended, and we had to carry the boat half a mile to another lake, about 1 mile wide and 3 long, with high grassy banks. This lake we traversed, passing on our way a small village situated on our left, and about half a mile from the edge of the lake. Again taking the boat out of the water, we carried her to a piece of water about 10 yards broad and 2 or 3 feet deep, situated on the sand by the sea-side, which, after we had followed for about a quarter of a mile, became very deep and rather wider, and turned off into the woods. After paddling 2 miles more we came to a village, consisting of about twenty houses, called Naralavo, where the boat was again taken out, carried 2 miles through the woods, and launched in a narrow stream not more than 3 or 4 yards broad (bordered with high water-plants growing in a marsh), along which we paddled for 4 miles with a strong current in our favour, and then came to a lake about a mile wide but very shallow, along which we went for 8 miles, the banks on each side being low and grassy, studded with clumps of trees. We then had to take the boat out and carry her  $1\frac{1}{2}$  mile to another piece of water about 10 yards wide, bordered with thick woods. After going along this about 8 miles, we stopped for the night at a small village. Resuming our journey next morning, May 6th, we found, after going 6 miles, the water widening considerably, forming a lake about half a mile long and a quarter of a mile wide, and only separated from the sea on one side by a narrow strip of sand. On the other side was the town of Vato Mandri, for the Governor of which we had brought letters of introduction from the authorities at Tamatave.

Almost immediately on our arrival, some officers of the Governor's household came down to meet us, and after exchanging friendly greetings left, returning again in an hour's time to conduct us to the Governor. In the meanwhile they had divested themselves of their picturesque national costume, which consists of an ample, handsomely bordered white or striped cloth, and put on ill-made black tail-coats, high shirt-collars, and tall black hats with curly brims, which latter dress they considered, I presume, more befitting the dignity of the occasion. The Governor was very civil, presenting us with a bullock and some geese and fowls in the name of the Queen, and paying us two visits at our house, accompanied by all his officers. The town itself was merely a cluster of the usual reed and straw houses to be found everywhere in the island, and contained perhaps 300 or 400 inhabitants, but the residence of the Governor was situated in an enclosure surrounded by high strong palisades.

Next morning the boat was carried 6 miles through the forest, to a deep but narrow piece of water (about 5 yards wide), with high reeds on each side, along which, after proceeding 3 miles, the lake widened to about 15 yards, the banks on each side being low and thickly wooded. Four miles' sailing with a fresh fair wind brought us to Mintinandi, a village consisting of about thirty or forty houses, where, as a good-sized house could be procured, and I was suffering from fever, we remained two days, in order to enable me to pick up a little strength. Starting again on the morning of May 9th, we paddled for 13 miles along a deep channel, varying in breadth from 20 to 100 yards, with low, thickly wooded, grassy shores on each side, and stopped for the night at a small village, containing about 100 inhabitants of a tribe called Timors. Their houses were smaller and dirtier than any we had met with at the villages in which we had previously stopped; circular shields covered with ox-hide were suspended from the walls. The inhabitants themselves were surly and unsociable.

Next morning, as we had ascertained from the natives that the boat would shortly have to be carried overland, and I was unable to walk, a rough litter was formed of two poles and a piece of matting, and I was sent 10 miles across country, through thick woods, to a village called Marosiky. This place consists of twenty or thirty houses, and is situated on a lake about 3 miles long and a mile wide, which is only separated from the open sea by about 50 yards of sand. My companions arrived about one hour and a half after me with the boat. After paddling about 4 miles through a channel 10 yards wide, between thickly-wooded banks, they had to take the boat out and carry her 3 miles through the forest, launching her on a piece of water similar to that which they had just traversed. A couple of miles' paddling along this brought

them to the lake on which Marosiky is situated. The next morning, as there were more portages, I was sent on again to Manoro in a palanquin, and, after being carried 30 miles, the greater part of the way over a level treeless plain, and exposed to a blazing sun, was set down utterly exhausted at the house of a Swiss trader, who immediately put me to bed, and made me as comfortable as he could.

The next day, May 12th, at 4 P.M., our boat came up to Xava's (the trader's), under sail. My companions, on leaving Marosiky, had paddled 5 miles along a lake about 50 yards broad, with thickly-wooded banks, after which the boat had been carried 5 miles overland, and launched in a shallow lake about a mile broad (with low marshy banks), along which they sailed for 15 miles with a strong fair wind, and then struck into a deep creek about 10 yards broad, which brought them, after 5 miles more sailing, up to Xava's house. The house is situated about three-quarters of a mile from Manoro, and is separated from the town by a sheet of water.

From Andivorante to Manoro was by far the most difficult part of the journey, both from the shallowness of the water and from the fact that the boat had to be carried overland no less than  $18\frac{1}{2}$  miles, though the total distance between the two places is only 114 miles.

At Manoro there is an open roadstead which ships occasionally visit, and the town itself is situated on a high bluff, and contains upwards of one hundred houses. It is very neat and clean. Inland from the top of this bluff the country, as far as the eye could reach, presented a low swampy appearance, intersected by a network of innumerable lakes and rivers, the view being bounded by a high range of mountains some 50 or 60 miles distant.

The day after their arrival at Manoro was devoted to repairing the boat as well as the means at hand would allow. The next morning I was so far recovered as to be able to accompany the rest of the party on a trip up one of the creeks to a place about 6 or 7 miles distant, belonging to Xava, where he was trying his hand at coffee planting; but the trees had been in the ground such a short time that it was impossible to tell whether the experiment would be successful. The country through which we passed was swampy, and the creek was about 10 yards wide, bordered with high water-plants. Xava's plantation, however, was on a rising ground, and near it were small woods.

The next day, May 15th, having lightened the boat as much as possible, by leaving at Xava's such articles as we did not immediately require, we again pursued our journey southward; Plant and I in the boat, the remainder going with Xava in a canoe.

On leaving Manoro, we proceeded for 4 miles along a creek

from 10 to 20 yards broad, bordered with reeds and water-plants, and then entered a narrow passage, with a mud-bank on one side and reeds on the other, deep enough to float the boat, but so narrow that we had to force our way through the reeds. After 10 miles of this we reached a deep river, 50 yards wide, running between high grassy banks, along which we proceeded for a couple of miles. We then arrived about sunset at a town called Betsiseran, the seat of government of a large province, the governor of which evidently expected our arrival, as a large house belonging to him was at once placed at our disposal.

Soon after taking possession of our quarters we heard strains of music proceeding from the Governor's residence at the battery (as all palisaded enclosures are termed in Madagascar) and learnt that he had that day received a messenger from the Queen bearing a silver spear, in token of her approval of his conduct, and was having a grand feast in consequence. About half an hour after our arrival he made his appearance, accompanied by his favourite wife, as also by his principal officers and their wives, a guard of honour and a brass band being also in attendance. The usual compliments were then exchanged, and he presented us with a pig and some fowls in the name of the Queen, the brass band playing outside the whole time.

Early the next morning he came down to see us, accompanied by his officers and band, and remained upwards of an hour, examining our fire-arms and drinking brandy, the band meanwhile playing several English and Scotch tunes very well. At 5 P.M. we took our departure, the whole party coming down to see us off, and the band playing 'God save the Queen.'

The town of Betsiseran is situated on rising ground, about a quarter of a mile from the river, and contains some 70 or 80 houses; but the dwellings of the Governor and his principal officers are distinct from the town, and surrounded by a high palisade.

After leaving Betsiseran we went along the river about 200 yards, and then struck into a shallow stream 5 yards broad, with sandy bottom, and sugar-cane growing on the banks. After proceeding, with a slight current in our favour, along this stream for 2 miles, we entered the great Mangoro River, 6 miles from its mouth. The river here was upwards of 2 miles broad, and contained several large sand-banks; the shore on each side was steep, and composed of sand, and a bar of that material checked the navigation at its mouth.

We crossed the river (the current running down at the rate of about 2 miles an hour) and landed at a small village, containing about twenty houses, about 3 miles lower down, at a house in which we left all our heavy stores. The next morning we sailed up the river in the boat for 14 miles, Xava accompanying us in a

canoe, the current against us becoming gradually stronger. We then came to a collection of three or four houses just below some rapids; the river at this point had become gradually narrowed to about half a mile.

Here we took to canoes, and ascended the river for about 10 miles, stopping for the night at a village of half-a-dozen houses situated on the top of a hill. It was hard work ascending the river, as the rapids and waterfalls succeeded one another at intervals of 200 or 300 yards, and the natives who accompanied us had to haul the canoes over them by main force.

The view from the village where we stopped was magnificent. On the one side, the river, here about half a mile wide, and studded with innumerable islands, rushed between densely wooded banks rising almost abruptly to a height of several hundred feet, whilst on the other, as far as the eye could reach, were irregular hills clothed from top to bottom with the bright green feathery foliage of the bamboo.

At sunrise next morning we continued our ascent of the river, and after proceeding 6 miles, and hauling the canoes through innumerable rapids, stopped for breakfast at a small village, nearly all the inhabitants of which were away working in the rice-fields, and appeared to have taken everything eatable with them. All we could get to eat were rice and beans. As we had not much time to spare, and going up the river in this way was very slow work, we now thought it best to return, and having engaged a pilot for each canoe, who guided them down the river with wonderful dexterity, we soon got back without accident to where we had left the boat, then re-embarked and descended the river. Next morning, May 19th, having taken our stores on board, we continued our journey south. And after paddling a mile down, the river turned into a deep channel about 10 yards wide between grassy banks, along which we went for 2 miles, and then stopped for a short time at a large village called "Ambodi Naran," containing at least 500 or 600 inhabitants.

The head-man of the village paid us a visit and made us presents. He was a fine old fellow, spoke the Creole language pretty well, and wore round his waist with great pride a belt and dagger that had been given him by Radana I. Leaving this village we paddled for 18 miles along a tideless river about 50 yards wide, the banks on each side covered with tropical foliage. We then emerged on a lake about 2 miles each way, surrounded with woods; which we crossed, and then stopped for the night at an empty house by the water-side.

The next morning the boat was carried a quarter of a mile through the woods, and launched in a deep channel about 30 yards wide, with trees down to the water's edge. Along this we paddled

for 6 miles, and then stopped for breakfast at a small village called "Andriantiara," which was almost entirely deserted, most of the inhabitants being out in the rice-fields.

Immediately after leaving this village we entered a sheet of water about half a mile broad, along which we went for 15 miles, and then came on a lake about a mile across, separated from the open sea only by a strip of land 200 yards broad. We traversed this for 4 miles, and then turned up into a creek about 10 yards wide, along which we paddled for a mile, and then stopped at a village called "Mawmalik," built on a rising ground, and consisting of 20 or 30 houses, where, as I had another touch of fever, we remained all the next day. Early in the morning of May 22nd the boat—having been carried 6 miles overland (the first mile through wood, the remainder over a sandy plain)—was launched on a winding sheet of water, about 50 yards wide, with low swampy banks swarming with crocodiles, which crawled into the water as the appearance of the boat round the corners disturbed them. After paddling a mile we came to a village called "Ambalamvoulok," where we stopped for breakfast, and 13 miles further on to a small tumble-down village called "Ambinanino," where we saw a good deal of raw cotton in some of the houses; here we stopped for the night.

The next morning we pursued our way along a deep channel, about 50 yards broad, with thickly-wooded banks for about 3 miles, and then entered a stream barely wide enough to permit of the passage of the boat, with a strong current in our favour and the trees meeting overhead. Along this we went for 7 miles, and then came out on a piece of water half a mile wide with well-wooded shores, which we traversed for 6 miles, and then stopped for breakfast at a neat village of about 20 houses, called "Saccalioni;" the woods surrounding the village were full of Mandarin orange-trees. Leaving this village we presently crossed a lake about 5 miles each way, on the shore of which was a large village beautifully situated on a rising ground, and then entered a channel about 100 yards broad, with woods on each side. Along this we paddled for 8 miles, passing on our way three good-sized villages, and then arrived at a small village called "Ambazote," where we stopped for the night.

Next morning, soon after starting, the river narrowed to about 50 yards with grassy banks. After going about 4 miles we passed through a canal about 100 yards long, 20 feet broad, and 5 or 6 feet deep, cut by a M. Ligie, a landed proprietor at Mahela; the cutting is through a clayey soil, and the banks are about 12 feet high. After going 6 miles along a winding sheet of water about 30 yards wide, with wooded banks, we came to a large village almost entirely deserted by the inhabitants who were out gathering

the rice crops; here we stopped for breakfast. After this we resumed our way along the same serpentine channel for 18 miles, and then came on to a sheet of water about half a mile broad, with only a belt of sand 100 yards wide between it and the sea. Along this we sailed for 5 miles, and then came to "Fanantari," a village of 30 or 40 houses built on a small hill near the edge of the lake, where we stopped for the night. Next morning, after going 200 or 300 yards up a river, about 50 yards wide, we turned into a deep narrow winding passage, along which we paddled under overhanging foliage for 12 miles, and then emerged on the lake of Mahela, a fine piece of water about 6 or 7 miles each way. Along its borders we paddled for about a couple of miles, and then arrived at M. Ligie's residence (situated about half a mile from the town), which we reached 2 p.m. on the 25th May.

The town of Mahela contains about 500 inhabitants, and is situated on a strip of sand about half a mile broad, on one side of which is the sea, forming an open roadstead visited by 2 or 3 ships in the course of the year, and on the other the lake stretching away inland for several miles. Beyond it lies thickly wooded country, and the whole view is bounded by a chain of mountains 70 or 80 miles distant.

Near the town we found a great extent of land under cultivation with rice, coffee and sugar-cane, the property of M. Ligie, who had resided in Madagascar nearly 30 years, and entertained us most hospitably during our stay at Mahela.

The day after our arrival the second Governor of the place paid us a visit, and after making us a present of a pig, some rice and some fowls, delivered us an invitation from the Governor to dine with him next day, which we accepted. The dinner came off at a house belonging to M. Ligie, as the Governor's residence was situated on the opposite side of the lake, and on its conclusion a band (very inferior to that at Betsiseran), struck up, and there was some dancing of a very solemn nature, something between a quadrille and a minuet.

Early on the morning of May 28th we left Mahela in two large canoes, each paddled by 12 men, and belonging to M. Ligie, who accompanied us. We continued our journey southward, going through the water at the rate of 6 miles an hour; we crossed the lake of Mahela, and then entered a piece of water about 30 yards wide with grassy banks, along which we paddled for 6 miles, and then stopped for breakfast at a small house by the water-side belonging to M. Ligie.

On quitting this the lake widened to about 100 yards, and we went on for 10 miles; during the greater part of which distance the shores on each side were covered with the remains of a burnt forest. We then came to a very narrow shallow ditch, along which



the canoes were dragged for a mile and a-half, and then taken out and carried a mile overland to another narrow creek with reeds on each side. Along this we went for 4 miles, and the canoes had again to be taken out and carried 2 miles overland to a river about 40 yards broad, with grassy banks bordered with high water-plants, along which we paddled for 5 miles, and then arrived at the town of "Masandrano." This place contains 500 or 600 inhabitants, and is situated on the sea-coast at the mouth of the Mananzari River.

The next morning we proceeded to ascend the Mananzari, which is a deep river about half a mile broad, running at the rate of 3 miles an hour between high grassy banks; but for the sand-bar at its mouth (M. Ligie informed us) it would be navigable by good-sized vessels for 50 miles. After paddling 9 miles up the river we stopped, at 8:30 A.M., on the 29th May, at a place where a sugar-mill and other buildings belonging to M. Ligie were situated on the southern bank of the river. Immediately opposite to us on the other side was the town of Mananzari.

We had now gone as far south as was practicable by water, having, since leaving Tamatave, travelled by lakes and rivers nearly 400 miles, and carried the boat 39 miles overland. The town of Mananzari forms the extremity of the Hova dominions in a southerly direction, and is built on two conical hills. On the top of each hill stands a large house belonging to the Governor and the other chief officer; its total population is about 1500.

I forgot to mention that on the north bank of the river, about 5 miles below the town of Mananzari, there is a good-sized village which had formerly been situated on the south bank, but has been moved bodily over to escape the attacks of the hostile tribes living to the southward. These tribes had also caused M. Ligie to discontinue working his sugar-mill on account of their predatory excursions. Their head-quarters was reported to be a large city about 200 miles south-west of Mananzari, situated on the top of a very high steep hill, the sides of which they had cut quite perpendicular, thus rendering their stronghold impregnable against an enemy unprovided with artillery. It was said to contain 30,000 inhabitants, and though the Hovas had repeatedly attacked it they had always been repulsed with great loss. The garrison was assisted even by the women, who rolled down large boulders and logs of wood upon the assailants.

Of this tribe, who are called Akongros, there were about 20 in Mananzari on a friendly visit to see M. Ligie. They were rough, powerfully-built, good-humoured fellows, wearing conical straw hats, and armed with swords and spears; they performed a war-dance opposite M. Ligie's door, and assured us that if we paid them a visit in their stronghold no harm should befall us. We on

our parts were nothing loth to accept their invitation, but as no certain information could be obtained of the distance we should have to travel, some telling us it was seven, others ten days' journey, and there being many rivers to cross with no canoes or bridges to help us, we were obliged to abandon the idea, more especially as the Governor of Mananzari strongly disapproved of our fraternizing with the enemies of his race, and gave us to understand that we could expect no assistance from him.

The morning after our arrival we received a visit from the Governor, who came across accompanied by his principal officers and about fifty soldiers. He said he was glad to see us, and asked us all to dinner in the evening. As I had got another touch of fever I was obliged to remain at home, but my companions went.

As we had only left Mauritius on two months' leave, and had accomplished our object of tracking the lakes from end to end, we now commenced to retrace our steps, sending our heavy baggage overland, and thus returning much quicker than we came.

We left Mananzari May 31st, arriving at Mahela on June 1st, and at Manoro June 6th. Between the latter place, which we left June 7th, and Andivorante, we found nearly a foot less water in the lakes than there had been during our journey south; this is accounted for by the fact that there had been hardly any rain since May 3rd.

Two nights after leaving Manoro, over-exertion in a hot sun caused me to have another bad attack of fever, and on our reaching Andivorante (June 11th) I was so much exhausted that it was judged advisable for me to remain there under the care of Johnston, whilst the others went on with the boat. On the 13th I rallied sufficiently to continue the journey in a palanquin. Early on that day we started off and arrived at Tamatave the next evening, overtaking Hewitt and Plant at Ivondrou, where a good bed and a few medical comforts not procurable on the lakes soon put me to rights.

The inhabitants of the different villages through which we passed during our journey appeared indolent and good humoured, their chief occupation consisting in the cultivation of rice, manioc and sugar-cane, and in the catching and drying of fish, with which all the lakes abound. They, however, take no thought for the morrow, and when they have sufficient for a few days' consumption, will sit at their doors and bask in the sunshine until it is necessary to work for more. Their houses throughout were built of the same materials, and in much the same manner as those at Tamatave; and at most of the villages fowls' eggs and rice were procurable. In no case had the boat to be carried more than 6 miles from one lake to another, and frequently, to effect a junction between two of the lakes,

it would only be necessary to enlarge a small water-course forming a connexion between them. The government authorities, however, will not allow the lakes to be cut into one continuous thoroughfare, and have refused M. Ligie permission to make the attempt, notwithstanding the facility they would then afford for the transmission of rice from the southern provinces to the port of Tamatave.

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#### IV.—*Second Journey into Equatorial Western Africa.*

By M. P. B. DU CHAILLU.

*Road*, January 8, 1866.

My objects in going back to Africa were manifold. First, I wished to study still further the so-called primitive and unsophisticated men of nature, in observing their habits, religion, mode of thinking, and language, as far as I could; and I hope I have been able to add something to our knowledge. I have written down many of their legends and fables. The long time I was obliged to remain in the Ashira country enabled me to acquire sufficiently the language of that tribe, and was of great use to me afterwards. I may say, that in their customs, superstitions, and legends, these people are all as I have represented them in my published work. In reading the books of Burton, Speke, and Grant, I find now and then words of Eastern Africa identical with those of the west, or nearly so. I have very little doubt that all along the equator from east to west, these numerous tribes came from one parent stock; and I think it would prove very interesting to ascertain how the people have separated themselves into so many tribes, and what led to the splitting up of tribes into clans. I have not been able to obtain sufficient light on this subject to form a positive opinion.

A fact which greatly attracted my attention was the gradual decrease of the population both on the sea-shore and in the interior. My second journey among the inland tribes, where the white man and his fiery water have never reached, has proved to me that the cause of the gradual decrease of population in this part of Africa lies deeper than the influence of the white man. All travellers who go over the ground a second time say that the population is decreasing, although some attribute this to one cause and some to another.

Next to observing the customs of primitive races, I desired to plunge again into the great domain of Nature, and study the habits of the other living creatures which inhabit these vast forests; for wherever I have been, the country, with very little exception, is

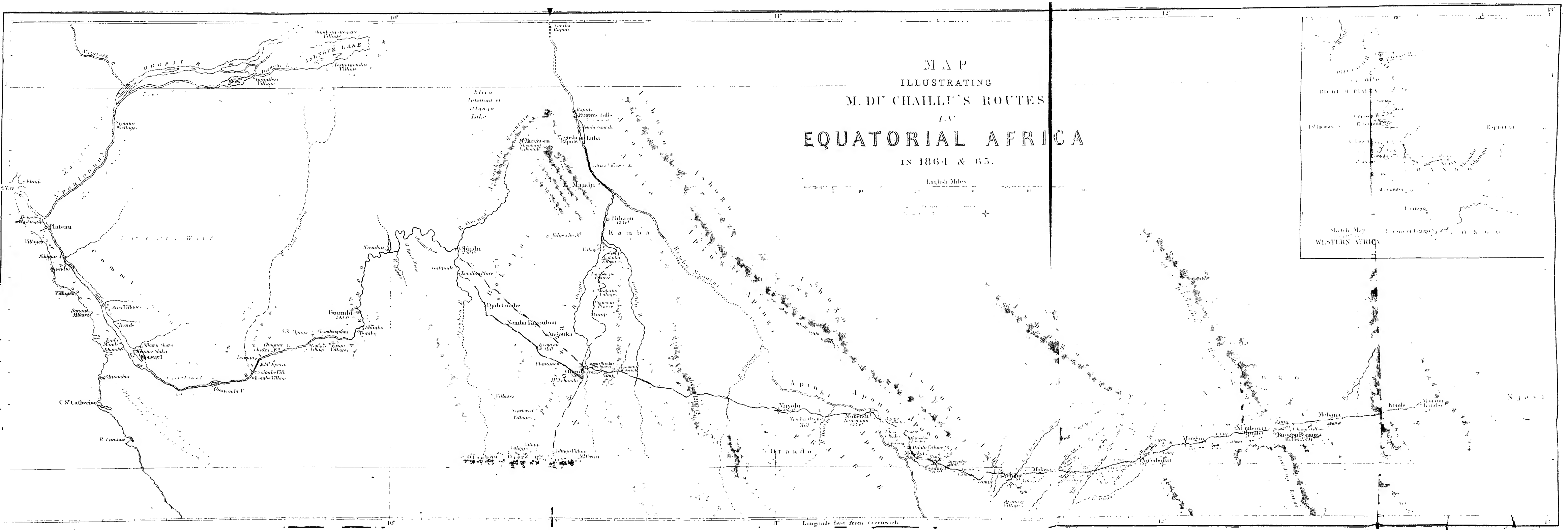
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a vast jungle, where man is but thinly scattered, and where no beast of burden can be found—man and woman being the only carriers.

I left London on the 5th of August, 1863, and reached the Fernand Vaz River on the 9th of October. I was received by the natives with great demonstrations of joy. Unfortunately on coming ashore the canoe which contained the greater part of my scientific instruments, chronometer, &c., was capsized, and the loss was irreparable to me in that country. Happily by the end of the following August a new set reached me from England, and my greatest thanks are due to Sir Roderick Murchison and the Fellows of this Society for the great interest they took in having these instruments replaced, and also to Captain George, my old teacher, who superintended their transmission. Permit me to state, that whilst I was detained for a space of ten months in waiting for these essentials, I was not idle. I employed my leisure time in collecting specimens of the fauna and flora of this productive part of the country, and remitted my collections to England, where, I am glad to say, they arrived safely, and have been in part deposited in the British Museum. I then commenced my journey into the interior. I will not detain you here with all the troubles which preceded my departure and attended the beginning of my journey. I shall proceed at once to state, that when I found myself at the headwaters of the Ovenga River, waiting, with my old friend the chief Quengueza, for the Ashira porters which King Olenda was to send me, I had with me only ten men and boys. I could get no more. These men were to be my body-guard to the end of my journey. I had always grateful feelings towards them for the great confidence they placed in me. I felt safe with them, for they were people of my own tribe, the Commi, with whom I had long lived; and not a man, I believe, in that tribe would ever try to injure a hair of my head. I only wished that thirty instead of ten could have been induced to come with me, for if I had had a larger body-guard I should not have been driven back as I was. It was a great comfort to me to know that none of these men would be unfaithful to me. They trusted me, for they knew that I should never leave them in danger and sickness.

After a good deal of trouble, for the difficulties of transport in these regions are enormous, I reached the village of Olenda, in Ashira-land; situated 110 miles from the mouth of the Fernand Vaz, by the route I followed. Old Olenda received me with open arms, and said he loved me as he would a sweetheart; but I was obliged to say, when he became rather exacting in the way of presents, that I was afraid he loved my goods and not me. He wittily answered that he loved both.

From the country of the Ashira I passed through the territories

of the Bakalai, Kamba, and Avia tribes, on an excursion northwards to the Samba Nagoshi falls, which I had not succeeded in reaching on my former visit. The journey was full of hardships, but I succeeded. The distance was about 50 miles northerly from Olenda. On the road I had a little adventure with gorillas. I had been wet the two preceding nights and days by continuous rains (for it rained 26 days during that month) and did not feel well—in fact, I was not strong enough to carry my revolver and gun. I was quietly going ahead of the party, when my attention was suddenly drawn to a crashing noise in the neighbouring trees. I thought it was produced by a flock of monkeys. I advanced cautiously in order to see what they were doing, and, to my surprise, counted ten gorillas, who, as soon as they saw me, came down and made off for the dense forest. One old male alone remained, and came down half-way to look around and see what was the matter. He gave a terrific roar and looked at me. Happily, my men came up, and the monster made off for the bush. We must assume from this circumstance that the gorilla is, at least sometimes, gregarious—a feature of its habits which I denied in my former work. Whilst I am on this subject, I will take the opportunity to say that I am now convinced I was wrong in stating in my former travels that it was the chimpanzee and not the gorilla that the old Carthaginian navigator Hanno relates having captured alive, for during my late journey the negroes captured an adult female gorilla, and I had her in my possession several days. Full-grown animals may therefore have been captured, and the species is not uncommon near the sea-shore at one part of the coast. I have seen in this journey a large number of this wonderful beast, and have had four alive at different times. After these opportunities of further observation, I see nothing to retract in the account I have formerly given of the habits of the gorilla.

We reached the river Ovigui, and after a few hours' sail down the stream emerged into the great Rembo, which was much swollen. We saw nothing but deserted villages, which gave to the shores a look of monotony and sadness so common in Africa. Finally, we reached the village of Luba, of the Avia tribe, situated above the rapids and falls.

The falls and rapids are called together Samba Nagoshi. A legend runs that two spirits, male and female, dwell there, and cause the commotion in the waters to prevent people from descending and ascending the river. In the middle fall lives the spirit Foogamoo, who roars and impels the waters with tremendous force.

There are three falls. The first, called Nagoshi (after the female spirit), is nothing but a rapid, and the river there has two islands. I was quite disappointed, for I thought this was the main

fall. But my guides then told me I must see the central fall, the Foogamoo, which was the great cataract and a few miles lower down. So after being delayed by two or three days of heavy rain, we started, and at the end of a long walk through the dense jungle we came before the great Foogamoo, the Mighty Spirit. The river here was about 150 yards wide, with an island in the midst, which breaks the fall into two, and consequently prevented me from seeing the other half. The fall on the side of the river where we stood was perhaps 70 yards wide. The other fall could not be more than 20 or 30 yards wide; but the greater part of the stream falls on that side, and with tremendous force. The height of the fall was about 15 feet, and though grand, it was nothing in comparison with the mighty surge and foaming below the cataract, which rushed along, billow after billow, as far as the eye could reach.

On my return to Olenda from visiting the falls, I began to speak of going further into the interior, and said I should like to go through the Apingi country. But Olenda said I could not go through the Apingi country, because a few days after I left in my former journey my friend Remandji and his eldest son died, and that immediately the people had said I killed him in order to travel with his spirit. So I was obliged to abandon the Apingi route, and resolved to proceed through the Otando country, a little to the south of Apingi.

Whilst we were making preparation for our journey, a fearful plague—the worst type of confluent small-pox—broke out, and the once beautiful and lovely Ashira country became a land of desolation and mourning. Nothing could be heard day and night but the wailing and moaning of the dying or mourners for the dead.

Finally, I prevailed on my good and noble Quengueza to go back to his country, although he did not depart until he had seen part of my luggage on the way, and made Olenda promise that he would send me with the remainder very soon. When I sent the first part of my luggage I called my men together, and said—“My children, I want you all to go with this luggage: I will follow with the remainder by-and-by. I am afraid that if you remain here you will get the plague also, and some of you may die. For myself, I am not afraid.” They said nothing, went away, and in a few minutes came back, saying, “We cannot do what you told us, father; we cannot leave you in this land of sickness: who is going to care for you if we leave you? What would the white men, what would our own people, say? No; some of us must remain with you: if we are to get the plague we must get it, but we shall not leave you alone here among these savages, so name half of our number to remain with you.” I cannot express with



what feeling I heard them; they were so earnest. I took five and sent five, and so five went with the first half of the luggage to the Otando country.

The plague afterwards increased in virulence. Olenda, my only friend, died, and many accused me of having caused his death by magical arts. My poor men became all ill. I stood alone, and wherever my eye rested, what a sight! living men looking like inanimate carcases; others mad (for the disease brought insanity); maggots could be seen dropping from the bodies of many. What a heap of suffering humanity! It was not for a day, but for a whole month, that I had to endure the torment. You may conceive my wretchedness—indeed, I envied the poor and starving of our land; for although starving myself, I had a scene of horror around me from which they were exempt. In my forlorn state I felt that my reason would give way. But several of the sick men said, “Do not let your heart be troubled: you will go where you wish to go.”

Finally, our party having recovered, I succeeded in leaving the Ashira country for the country of Otando. There I found my other men stricken with the plague, or small-pox, and the whole country, with the exception of the chief, unwilling to receive me, for, said they, wherever the white man goes, he brings death and kills the chief; witness Remandji and Olenda. As fate would have it, four days after my arrival Mayolo, the Otando chief, became ill, and his life was in danger. Finally, he got better, and we then prepared for the continuance of our journey.

Mayolo was a good man, but very avaricious. I made the unpleasant discovery that he was practising one of the superstitious arts of the country upon me in order to open my heart towards him, that is, make me generous in giving him presents. This was the “alumbi,” and consists in administering to the guest operated upon doses of the powdered skull of a deceased ancestor, mixed with food cooked by the wife. My suspicions were aroused when I found the cooked meal sent to me with great punctuality; but I had just obtained information of this strange custom, and refused to eat of the dish. The way the thing is prepared is this: when a chief dies his head is cut off and placed in the midst of a quantity of clay in a vessel. All the soft and liquid parts are absorbed, and the skull then preserved in the “alumbi” house; and when it is to be used the chief goes in and scrapes a quantity of powder off the bone. The saturated clay or chalk is also used for anointing the body as a charm.

Mayolo's village is situated E.S.E. of Olenda, the capital of Ashira-land, and is 40 miles distant from that town. After leaving it we travelled nearly due east and passed through the Apono country, meeting with many difficulties, owing to the fear of the

inhabitants that we should introduce the plague amongst them. In one place they set fire to the bush to oppose our progress. The Apono have the custom of extracting always two of their upper incisor teeth; they are very warlike, but great drunkards. This is the last place in travelling eastward that I found any knowledge of European goods or fire-arms amongst the natives; henceforward we entered the domain of the purely primitive tribes. Next to the Apono came the Ishogo tribe, a gentle and kind-hearted people, who excel in the manufacture of cloth from the fine cuticle of palm-leaves.

In this interior region I fell in with a wandering tribe of dwarf negroes. They never labour, but lead a vagrant life, remaining but a short time at the same place. They seemed to be the lowest type of human beings I had hitherto met with. They trap game and sell it to the tribes among whom they are for the time living, in exchange for plantains. They are of light brown colour of skin, and, though very short in stature, the men are well made and generally hairy on great part of the body. The hair of the head is much shorter than in the negroes of this part. The women, of whom I measured several, are from 4 feet 4 to 4 feet 5 inches in height.

We next entered the Ashango territory; the country becoming more and more mountainous and travelling more difficult as we advanced. The road was a mere narrow path through a dense forest, and we were obliged to march in single file, up hill and down, over rocks and fallen trees, which encumbered the path and made our journey with the loads we carried most toilsome. Part of our cargo was plantains, for provisions, and these make a very heavy load. At the village of Mongon, in Ashango (265 miles by road from the mouth of the Fernand Vaz), I found the height by aneroid barometer to be 2488 feet above the level of the sea. Ahead of us were occasionally visible the summits of a higher range; but there are no plateaux—all is ascent and descent. The sky in this mountainous region was generally obscured with clouds, and a light gray mist veiled the summits of the wooded hills. There is no dry season, properly speaking, in this hilly region, as it rains more or less all the year round. The greatest fall of rain I observed was  $6\frac{1}{2}$  inches in 24 hours. We frequently had to wade across streams, and were wet all day long. The Ashango were very hospitable to me, though they are a warlike people, and their porters were very exacting in their demands. The villages are larger than those of tribes near the coast; some of them a quarter or half a mile in length, and the houses are square at the ends, not round huts as in other parts of Africa. Some of the villages have as many as 300 huts. The villages are far apart, and are con-

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nected by the narrow forest-paths I am speaking of. I have no doubt Africa could be crossed by these narrow paths.

I was now getting forward on my journey very nicely. I was beginning to hear of a large river ahead, on the banks of which live the Ashangui tribe, and had only to pass the Njavi and Abombo tribes before reaching them. The slaves exported by these two tribes do not come down to the sea this way, but down the Congo River.

Everything was looking hopeful. Wherever I went I was well received, when an unforeseen accident suddenly put an end to my further progress.

We had reached the village of Mooogo Kombo, 440 miles from the mouth of the Fernand Vaz, and the porters who brought us from the last village had left us there. The villagers had received us very well, and we had been there four days vainly waiting for the chief to supply us with a fresh supply of porters. Being put off from day to day I told my men we had better leave the village, to show the people we were vexed. So we went and established our camp near by. As I expected, the next morning the old men of the village came, and addressing themselves to my men, said, "What! shall the spirit sleep in the forest when there is a house in the village for him? Come again to us, and we promise to take you forward to-morrow." After they had begged several times, I consented to go back. The chief, Kombo, soon made his appearance, and in the course of a grand palaver explained that the reason why we were detained was that the people ahead were afraid of us, and did not want us to pass. If we had chosen another road, he added, pointing to the north-east and south-east, there would have been no trouble. "Eat this goat and plantains to-day," said he, "and to-morrow you shall be off."

Soon after the palaver was over my attention was drawn to four men entering the village. Kombo sent word to me to hide myself, as these belonged to the very people who opposed my passage through their district. At the same time he told my men to make them afraid by firing their guns. I scarcely knew what was going on until I heard the discharge of a gun, followed soon after by another. I then saw the people flying in all directions, and the chief came to me and exclaimed, "You say you do not come here to kill people; is not this the body of a man?" The gun which one of my men had fired had accidentally killed a man, who died without a struggle.

At once I saw the gravity of my position. Every villager had disappeared. I shouted to them to come back, for we had not killed the man intentionally, and I would pay the price of twenty

men if they would let us have a friendly palaver. To back up my words I began to spread before me goods and presents, and some few of the bolder men came forward saying, "Let us talk the palaver." But others said, "Let us have war; they have come to kill us." They did not agree amongst themselves, and knowing the negro character, I thought I could keep them in that mood for a while, and their excitement would soon be over. When lo! a woman came forward, tearing her clothes and crying out that her sister was killed. The shot which had killed the man had penetrated the wall of a hut and made a second victim. She was the wife of the man who wanted the palaver to be settled. So there was an end of all chance of peace. The war-drum was beat, and I could see emissaries starting off to call the people of neighbouring villages to the fight. They came all armed with spears and poisoned arrows. These events took much less time to occur than I now take to relate them. I ordered immediately a retreat, and stopped my men from firing, knowing that we were in the wrong.

We left the village in good order with all the more precious part of my baggage. Igala, one of my men, and myself were wounded, and the arrows were flying thickly around us, but I was resolved not to repulse the attack unless the villagers persisted in pursuing us.

After we had entered the narrow forest-path, a panic seized my men, and they began to throw away their loads in order to flee quicker. As I brought up the rear with the man who had been the cause of the disaster, I saw, to my great dismay, my precious instruments, collections of natural history, photographs of scenery and natives, note-books and goods scattered in the jungle—the work of many months irrecoverably lost. My men threw away all that I most esteemed, but retained their loads of beads and other articles which they valued. They only stopped in their flight when forced to do so from sheer exhaustion. I received a second wound from a poisoned arrow which pierced through the belt of my revolver and entered my side, but fortunately the poison was scraped from it in passing through the leather.

We had to run from 9 A.M. till 5 P.M., passing through three villages during that time, and we repulsed our assailants five times. We had another populous village, about one mile long, to pass through before reaching a friendly tribe, and being so exhausted we concluded that it would be more prudent to wait until its inhabitants were asleep, for then we might get through without fighting. We concluded to rest in the forest. My men slept, and towards midnight we rose. I sent scouts, who soon reported that everything was silent, and that all the inhabitants were asleep. We emerged from the dark forest, and when we came to the village we gathered together, cocked our guns and resolved to sell our

lives dearly if the villagers should attack us. Treading lightly, we went onward, passing house after house, and sometimes hearing the natives talk among themselves. In one place they were playing inside the hut on the harp, but did not hear us pass. There remained only a few houses to pass, when suddenly a bonfire was lighted, and we then thought we should have to fight our way. At this moment a man appeared, and I recognised his voice to be that of the chief with whom I had remained a week on my way into the interior. He said, "I hear a noise, perhaps you are the people of the white man; go on, we have no war with you." How glad I was to hear these words! But preserving silence, and still fearing treachery, we went onward through different paths. About four o'clock in the morning we came to a cassava-field. We ate some of it, though it might have proved poisonous, for cassava before being fit to eat must be soaked in water for a few days. My men rested for an hour, and then we proceeded once more towards the coast. I reached the mouth of the Fernand Vaz at the end of September. I was then in rags and penniless, but fortunately I found a vessel about to sail for London in a few days.

## M. DU CHAILLU'S ASTRONOMICAL OBSERVATIONS.

### DETERMINATION OF LATITUDE FROM MERIDIAN ALTITUDES.

(Computed by EDWIN DUNKIN, F.R.A.S.)

Date.	Name of Station.	Object Observed.	Resulting Latitude South.		
1864.					
Oct. 21	Goumbi .. .. .	Mars .. ..	°	'	"
22	" .. .. .	$\alpha$ Cygni .. ..	1	33	18
24	" .. .. .	Fomalhaut .. ..	1	36	46
28	Junc. Niembai with Ovenga River .. ..	" .. ..	1	36	37
Nov. 6	Junc. Ofoubou with Ovenga River .. ..	" .. ..	1	38	23
22	Olenda .. .. .	" .. ..	1	36	14
29	" .. .. .	" .. ..	1	44	31
"	" .. .. .	" .. ..	1	43	26
"	" .. .. .	$\alpha$ Eridani .. ..	1	45	15
"	" .. .. .	$\alpha$ Arietis .. ..	1	44	58
"	" .. .. .	Mars .. ..	1	44	55
Dec. 11	Rembo, near Samba Nagoshi Falls, Mandji .. .. .	$\alpha$ Eridani .. ..	1	16	26
14	Dihaou .. .. .	Capella .. ..	1	21	10
"	" .. .. .	Mars .. ..	1	20	55
"	" .. .. .	$\alpha$ Eridani .. ..	(1	26	18)*
27	Olenda .. .. .	Capella .. ..	1	44	49
30	" .. .. .	Mars .. ..	1	44	12
"	" .. .. .	Capella .. ..	1	43	48
1865.					
Mar. 30	Mayolo .. .. .	$\beta$ Ursæ Majoris .. ..	1	51	22
Apr. " 2	" .. .. .	$\alpha$ .. ..	1	51	29
"	" .. .. .	Pollux .. ..	1	51	42

\* Probably read off 10' too great.

DETERMINATION OF LATITUDE, &c.—*continued.*

Date.	Name of Station	Object Observed.	Resulting Latitude South.
1865.			
Apr. 2	Mayolo .. .. .	$\alpha$ Crucis .. ..	0 51 17
6	" .. .. .	$\alpha$ Ursæ Majoris ..	1 50 44
May 1	" .. .. .	$\alpha$ Crucis .. ..	1 51 5
5	" .. .. .	$\eta$ Ursæ Majoris ..	1 51 2
6	" .. .. .	$\alpha$ Crucis .. ..	1 51 6
12	" .. .. .	$\alpha$ Centauri .. ..	1 51 25
14	" .. .. .	$\beta$ Ursæ Majoris ..	1 51 5
15	" .. .. .	$\alpha$ Centauri .. ..	1 51 31
"	" .. .. .	$\beta$ .. ..	1 51 25
"	" .. .. .	Arcturus .. ..	1 50 57
"	" .. .. .	$\alpha$ Crucis .. ..	1 51 22
16	" .. .. .	" .. ..	1 51 23
"	" .. .. .	$\beta$ Ursæ Majoris ..	1 50 41
18	" .. .. .	$\gamma$ .. ..	1 51 33
"	" .. .. .	$\alpha$ Crucis .. ..	1 51 13
"	" .. .. .	$\epsilon$ Ursæ Majoris ..	1 50 59
30	Nchiengain .. ..	$\alpha$ Crucis .. ..	1 51 15
"	" .. .. .	Arcturus .. ..	1 51 14
31	" .. .. .	$\beta$ Centauri .. ..	1 51 10
June 2	" .. .. .	$\eta$ Ursæ Majoris ..	1 51 10
"	" .. .. .	Antares .. ..	1 51 1
5	Mokaba .. ..	$\alpha$ Crucis .. ..	1 58 47
"	" .. .. .	$\eta$ Ursæ Majoris ..	1 58 36
6	" .. .. .	$\alpha$ Crucis .. ..	1 58 37
"	" .. .. .	$\zeta$ Ursæ Majoris ..	1 58 19
"	" .. .. .	$\eta$ .. ..	1 58 6
"	" .. .. .	$\alpha$ Centauri .. ..	1 58 32
8	" .. .. .	$\alpha$ Crucis .. ..	1 58 28
10	Igoumbié .. ..	$\alpha$ Crucis .. ..	1 59 28
"	" .. .. .	$\beta$ Centauri .. ..	1 59 6
"	" .. .. .	$\alpha$ .. ..	1 59 33
11	" .. .. .	$\alpha$ Crucis .. ..	1 59 28
"	" .. .. .	$\eta$ Ursæ Majoris ..	1 58 57
"	" .. .. .	Arcturus .. ..	1 59 32
"	" .. .. .	$\alpha$ Centauri .. ..	1 59 28
14	Yengué .. ..	$\beta$ .. ..	2 0 46
"	" .. .. .	$\alpha$ .. ..	2 0 52
15	Mokenga .. ..	$\beta$ .. ..	2 0 47
"	" .. .. .	Arcturus .. ..	2 1 2
16	" .. .. .	" .. ..	2 0 52
"	" .. .. .	$\alpha$ Centauri .. ..	2 1 4
17	" .. .. .	$\beta$ .. ..	2 1 11
"	" .. .. .	$\eta$ Ursæ Majoris ..	(2 3 23)*
"	" .. .. .	$\epsilon$ Bootis .. ..	2 1 42
"	" .. .. .	$\alpha$ Coronæ .. ..	2 0 36
26	Niembonai .. ..	Antares .. ..	1 58 47
"	" .. .. .	Arcturus .. ..	1 59 0
July 5	Mongon .. ..	$\alpha$ Centauri .. ..	1 56 45
17	Mobana .. ..	$\alpha$ Centauri .. ..	1 52 56

\* Marked "hazy" in journal.

For the final adopted latitudes see the Synoptical Table at the end.

## DETERMINATION OF LONGITUDE FROM THE OBSERVED LUNAR DISTANCES.

Date.	Name of Station.	Distance observed between Moon and	Star E or W. of Moon.	Resulting Longitude East.
1865.				
Jan. 6	Olenda	Sun .. ..	w. 10 10 0	
" "	"	" .. ..	w. 10 17 45	
17	"	" .. ..	E. 10 43 30	
" "	"	" .. ..	E. 10 35 0	
Feb. 3	"	Pollux .. ..	E. 10 48 45	
" "	"	" .. ..	E. 10 44 0	
" "	"	" .. ..	E. 11 5 15	
Apr. 1	Mayolo	Sun .. ..	w. 10 42 0	
" "	"	" .. ..	w. 10 43 30	
" "	"	Venus .. ..	w. 11 5 15	
" "	"	" .. ..	w. 10 53 45	
2	"	" .. ..	w. 10 48 15	
" "	"	" .. ..	w. 10 56 30	
" "	"	Spica .. ..	E. 11 34 45	
" "	"	" .. ..	E. 11 4 30	
" "	"	" .. ..	E. 11 31 30	
" "	"	Saturn .. ..	E. 11 37 0	
3	"	Sun .. ..	w. 10 36 15	
" "	"	Aldebaran .. ..	w. 10 55 45	
11	"	Pollux .. ..	w. 10 36 30	
" "	"	Regulus .. ..	w. 10 28 0	
13	"	Saturn .. ..	w. 10 35 30	
" "	"	" .. ..	w. 10 33 0	
20	"	Sun .. ..	E. 11 36 15	
May 1	"	Spica .. ..	E. 11 37 0	
" "	"	" .. ..	E. 11 20 0	
" "	"	" .. ..	E. 11 17 30	
" "	"	Saturn .. ..	E. 11 19 45	
" "	"	" .. ..	E. 11 19 15	
4	"	Jupiter .. ..	E. 10 53 15	
" "	"	" .. ..	E. 11 10 30	
" "	"	" .. ..	E. 10 56 0	
" "	"	" .. ..	E. 11 18 15	
6	"	" .. ..	E. 11 7 15	
" "	"	" .. ..	E. 11 11 15	
" "	"	" .. ..	E. 11 1 0	
" "	"	" .. ..	E. 10 53 0	
June 1	Nchiengain	" .. ..	E. 11 16 15	
" "	"	" .. ..	E. 11 19 0	
" "	"	" .. ..	E. 10 58 45	
" "	"	" .. ..	E. 10 57 45	
" "	"	" .. ..	E. 11 8 30	
7	Mokaba	" .. ..	E. 11 20 15	
" "	"	" .. ..	E. 11 10 15	
" "	"	Regulus .. ..	w. 11 34 45	
" "	"	" .. ..	w. 11 22 45	
" "	"	" .. ..	w. 11 33 0	
" "	"	" .. ..	w. 11 23 15	
11	Igoumbié	Jupiter .. ..	w. 11 8 30	
" "	"	" .. ..	w. 11 28 30	
" "	"	" .. ..	w. 11 23 45	
" "	"	" .. ..	w. 11 8 15	

DETERMINATION OF LONGITUDE, &c.—*continued*.

Date.	Name of Station.	Instance observed between Moon and	Star F. or W. of Moon.	Resulting Longitude East
1865.				
June 11	Igoumbié .. .. .	Jupiter .. .. .	W. .. .. .	11° 14' 30"
"	" .. .. .	" .. .. .	W. .. .. .	11° 9' 15"
"	" .. .. .	" .. .. .	W. .. .. .	11° 23' 0"
30	Niembouai .. .. .	" .. .. .	E. .. .. .	11° 23' 0"
"	" .. .. .	" .. .. .	E. .. .. .	11° 44' 45"
"	" .. .. .	" .. .. .	E. .. .. .	11° 42' 15"
"	" .. .. .	" .. .. .	E. .. .. .	11° 57' 15"
"	" .. .. .	" .. .. .	E. .. .. .	12° 4' 0"
July 5	Mongon .. .. .	Spica .. .. .	W. .. .. .	12° 24' 0"
"	" .. .. .	" .. .. .	W. .. .. .	12° 7' 30"
"	" .. .. .	" .. .. .	W. .. .. .	12° 7' 30"

For the final adopted longitudes obtained from a discussion of the preceding results, see the Synoptical Table which follows.

SYNOPSIS OF RESULTS.

Name of Station.	Adopted Latitude South.			Adopted Longitude East.			Height above Sea-level by	
							Barometer.	Boiling- water.
	°	'	"	°	'	"	Fect.	Fect.
Goumbi (hill) .. .. .	1	35	34	°	..	..	143	
" (back, hill top) .. .. .		..	..		..	..	238	179
Junc. of Niembai with Ovenga River	1	38	23		..	..	143	
Junc. of Ofoubou with Ovenga River	1	36	14		..	..	39	55
Hill top, back of Obindji .. .. .		..	..		..	..	258	422
River level. Obindji .. .. .		..	..		..	..	54	
Nomba Rigoubou .. .. .		..	..		..	..	369	
Olenda .. .. .	1	44	22	10	30	34	526	
Nehondo .. .. .		..	..		..	..	636	
"On the road" .. .. .		..	..		..	..	429	
Opangano .. .. .		..	..		..	..	553	
Lambengué .. .. .		..	..		..	..	478	
Louvendji .. .. .		..	..		..	..	490	
Luba .. .. .		..	..		..	..	383	
Rembo, near Samba Nagoshi Falls	1	16	26		..	..	322	
Fongamou .. .. .		..	..		..	..	347	
Dihao (Ovigui) .. .. .	1	21	3		..	..	323	326
Mayolo .. .. .	1	51	14	11	0	37	496	
Nchiengain .. .. .	1	51	10	11	14	35	325	
Mokaba .. .. .	1	58	29	11	21	51	414	
Njavi plantation .. .. .		..	..		..	..	610	
Dogoundou .. .. .		..	..		..	..	473	
Igoumbié .. .. .	1	59	22	11	25	0	410	
"On the road" .. .. .		..	..		..	..	305	
Yengué .. .. .	2	0	49		..	..	369	



SYNOPSIS OF RESULTS—*continued*.

Name of Station.	Adopted Latitude South		Adopted Longitude East.		Height above Sea-level by	
					Barometer	Boiling- water.
Mokenga .. .. .	2	"	"	2	520	508
"On the road" .. .. .					728	
Madombo .. .. .					1226	
"On the road" .. .. .					1486	
Olako .. .. .					1480	
Njavi and Ashango village .. .. .					1481	
Niembouai .. .. .	1	58	54	11	1883	1910
Ouana River .. .. .					1285	
"On the road" .. .. .					1908	
Mogwana .. .. .					2264	
Mongon .. .. .	1	56	45	12	2488	
Buogou Bouanga .. .. .					2574	
Mobana .. .. .	1	52	56		2369	
Mouaou .. .. .					2074	

EDWIN DUNKIN.

*January 22, 1866.*

V.—*Description of the Neighbourhood of Somerset, Cape York, Australia.* By JOHN JARDINE, Esq., Police-Magistrate, Somerset, Cape York.

*Recd, January 22, 1866.*

THE portion of country to which my observations particularly apply is that which I think may correctly be termed the York Peninsula Proper, and comprises the land lying to the northward of a line drawn from the estuary of the Kennedy River, at the head of Newcastle Bay, to the opposite or north-west coast. The general course of the Kennedy River runs in this line, and from the head of the tideway to the north-west coast the breadth of land does not exceed 6 miles. The mouth of the river falling into the sea a short distance to the southward of Barn Island will be nearly met by the western extremity of this line.

The land on the neck thus formed presents singular features. There is no defined or visible watershed; a succession of low irregular ridges, divided by swampy flats, extends from coast to coast, and the sources of the streams running into either overlap in a most puzzling manner. The large ant-hills which are spread over the whole of this country may be taken as sure indicators of the nature of the soils; on the ridges a reddish sandy loam, intermixed with ironstone gravel, prevails; on the flats a thin layer of decomposed vegetable matter overlays a white sand, bearing

*melaleuca* and *pandanus*, with a heavy undergrowth of a plant much resembling tall heath. Nearly every flat has its stream of clear water; the elegant "pitcher" plant grows abundantly on the margins. The timber is poor and stunted, chiefly bloodwood and *grevillea*, and the grass is coarse and wiry.

Leaving this neck of barren and uninteresting country the land to the northward rises, and a distinct division or spine is formed, ending in Cape York. From it, on the other side, spurs run down to the coast, frequently ending in abrupt precipices overhanging the sea; in other places gradually declining to the narrow belt of flat land which occasionally borders the shore. The formation is, I may say, entirely sandstone, overlaid in many places by a layer of lava-like ironstone. Porphyry occurs occasionally in large masses, split and standing erect in large columns, at a distance resembling basalt. The sand-tone is of the coarsest quality, almost a conglomerate, and is soft and friable; exposure to the air might probably harden it, if quarried, when it would be available for rough building. The ridges, with very few exceptions, are topped with large blocks of ferruginous sandstone, irregularly cast about, and are covered with a thick scrub, laced and woven together with a variety of vines and climbers; while the small valleys intervening bear a strong growth of tall grass, through which numerous creeping plants twine in all directions, some of them bearing beautiful flowers. Among them I may particularise two species of *ipomœa*, which I believe to be undescribed, and a vine-like plant, bearing clusters of fruit much resembling in appearance black Hambro' grapes, wholesome and pleasant to the taste. The scrubs are formed of an immense variety of trees and shrubs, far too numerous for me to name, were I able to do so. Some of them have fine foliage, and bear handsome flowers and agreeably-tasted fruit, and would form most ornamental additions to our southern gardens and pleasure-grounds. Several species of the numerous climbing-plants produce a fine and strong fibre, from which the natives make their fishing-lines. Some fine varieties of palm are found on the moister lands near the creeks, two especially elegant, a *seaforthia* and a *caryota*. A wild banana, with small but good fruit, is also found in such localities. On the open grounds the bloodwood, Moreton Bay ash, and a strong-growing acacia are the principal trees. Timber for building is scarce, and of very indifferent quality. The ironbark and pine are unknown here.

The soil on these grounds is a reddish loam, more or less sandy, and thickly covered with a coarse ironstone gravel. Much of the ironstone has a strong magnetic property, so much so as to suspend a needle; and it was found a great inconvenience by Mr. Surveyor Wilson, from its action on the instruments. As the land

descends, the soil becomes more sandy. Near the creeks patches with a considerable mixture of vegetable loam are found, which would be suitable for the growth of vegetables, bananas, &c. The grass is generally long and coarse, and, soon after the rainy season ceases, becomes, under the influence of the strong south-east winds, withered and dry. Horses and cattle keep their condition fairly, but sheep do not thrive; the country is quite unsuited to them. Goats may be kept with advantage, and pigs find an abundant supply of food in the scrubs and swamps.

In the zoology of the district, the careful researches of Mr. McGillivray, the naturalist attached to Her Majesty's surveying-ship *Rattlesnake*, have left little room for the discovery of many positive novelties. I have, however, been able to note many interesting facts in the economy and habits of the birds, especially such as relate to their migration. Several of the species found here are season visitors of New South Wales, and it is interesting to compare the times of their arrival and departure in this place with those in the southern colony.

The animals afford small variety. The dingo or native dog, four species of the smaller kangaroos, and two other marsupials are found. One, an elegant little squirrel-like opossum, striped lengthways with black and white, I believe to be new.

Birds are more plentiful. My collection comprises more than one hundred species of land-birds, many of them remarkable for beauty of plumage and peculiarity of form, structure, and habit. Among the most remarkable are the great black macaw (*Microglossus aterrimus*), the magnificent rifle-bird (*Ptiloris magnifica*), and the rare and beautiful wood-kingfisher (*Tanysiptera sylvia*). The latter first made its appearance here on the 30th of November last. On the afternoon and night of the 28th and the 29th of that month there was a heavy storm of rain, with wind from the north-east, and the next morning the bush along the shore was ringing with the cries of the new arrivals. To my constant inquiries of the blacks for this bird I was always told by them that when the wind and rain came from the north-east the birds would come, and their prediction was verified to the letter. They also say the birds come from Dowdai (New Guinea). I think this probable, as several of the birds described by the French naturalist, M. Lesson, as found by him in New Guinea have also appeared here for the breeding season. The *Megapodius Tumulus* is also worthy of mention on account of the surprising structure of its nest. The mound resembles and is composed of the same materials as that of the brush-turkey (*Talegalla*), but it is very much larger. Some that I have measured are upwards of 30 feet in diameter at the base, and rise, at the natural angle, to a height of 15 feet or more. It is wonderful how birds so comparatively diminutive can

accumulate so large a pile. These birds live in pairs, and several pairs use the same mound. The eggs are deposited at a depth of from 1 to 3 feet; the heat at that depth is very great, more than the hand can bear for any length of time. I cannot say whether the young, when released from the mounds, are tended by the parents; they, however, return and roost in the mounds at night. The flesh of the *Megapodius* is dark and flavourless, being a mass of hard muscle and sinew. Birds which may be called game are not numerous. The brush-turkey (*Tulegalla*), the *Megapodius*, several species of pigeon, with a few ducks and quail, comprise the whole.

Fish are in abundance and in great variety, some of them of strange form and singular brilliancy of colouring. The grey mullet, the bream—a fish much resembling in general appearance the English pike—and several others, are excellent eating.

Three species of turtle are plentiful during the season—that is, the period when they approach the shores to deposit their eggs: the green, the hawksbill, and another species which grows to a much larger size than either of the above. The natives take large numbers of the former; indeed, from the month of November till February turtle forms their principal food. The green turtle are taken in the water by the blacks, who display great address in “turning” them. They are approached when asleep on the surface; the black slips gently from his canoe and disappears under water, and, rising beneath the animal, by a sudden effort turns it on its back, and by a strong wrench to the fore-flipper disables it from swimming. The fisherman is assisted by his companions in the canoe, and a line is secured to the turtle. This is hazardous sport, and deep wounds are frequently inflicted by the sharp edges of the shells, which in the female turtle are very sharp.

A singular mode of taking the hawksbill turtle is followed by the natives here. This custom, though said to be known so long back as the time of the discovery of America by Columbus, is so strangely interesting that I will give a short account of it as I have seen it practised. A species of sucking-fish (*Remora*) is used. On the occasion to which I allude, two of these were caught by the blacks in the small pools in a coral reef, care being taken not to injure them. They were laid in the bottom of a canoe, and covered over with wet sea-weed—a strong fishing-line having been previously fastened to the tail of each. Four men went in the canoe; one steering with a paddle in the stern, one paddling on either side, and one in the fore-part, looking out for the turtle and attending to the fishing-lines; while I sat on a sort of stage fixed midship, supported by the outrigger-poles. The day was very calm and warm, and the canoe was allowed to drift with the current, which

runs very strong on these shores. A small turtle was seen, and the sucking-fish was put into the water. At first it swam lazily about, apparently recovering the strength which it had lost by removal from its native element; but presently it swam slowly in the direction of the turtle, till out of sight; in a very short time the line was rapidly carried out, there was a jerk, and the turtle was fast. The line was handled gently for two or three minutes, the steersman causing the canoe to follow the course of the turtle with great dexterity. It was soon exhausted and hauled up to the canoe. It was a small turtle, weighing a little under 40 lbs., but the sucking-fish adhered so tenaciously to it, as to raise it from the ground, when held up by the tail, and this some time after being taken out of the water. A strong breeze coming on, the canoe had to seek the shore without any more sport. I have seen turtle weighing more than 100 lbs., which had been taken in the manner described. Though large numbers of the hawksbill turtle are taken by the Cape York natives, it is very difficult to procure the shell from them; they are either too lazy to save it, or if they do so, it is bartered to the Islanders of Torres Straits, who use it for making masks and other ornaments.

Although there is a considerable variety of reptiles, snakes do not appear to be very numerous. The common brown snake and death-adder are found; carpet-snakes appear to be the most common, and grow to a large size. They have been very troublesome by killing our poultry at night. They seem to be blood-thirsty creatures, frequently killing much larger animals than they can possibly swallow, and are not satisfied with one victim at a time. One which was killed in my fowl-house had three half-grown chickens compressed in its folds, and held one in its jaws. A short time since I was roused in the middle of the night by the piteous cry of a young kangaroo dog, and on running out found it rolling on the ground in the coils of a large carpet-snake. The dog was severely bitten in the loin, but in the morning was quite well, proving that the bite of this reptile is innocuous. This snake measured nearly 12 feet in length.

Crocodiles are found in numbers in the Kennedy River and a lagoon, which has communication with its estuary. They are also seen occasionally in the bays in Albany Passage.

Of the aborigines of Cape York I can say little more than has already been so often repeated in descriptions of the natives of other parts of the Australian continent. The only distinction, that I can perceive, is that they appear to be in a lower state of degradation, mentally and physically, than any of the Australian aboriginal tribes which I have seen. Tall, well-made men are occasionally seen; but these almost invariably show decided traces of a Papuan or New Guinea origin, being easily distinguished by

the "thrum-like" appearance of the hair, which is of a somewhat reddish tinge, occasioned, no doubt, by constant exposure to the sun and weather. The colour of their skin is also much lighter—in some individuals approaching almost to a copper colour. The true Australian aborigines are perfectly black, with generally woolly heads of hair; I have, however, observed some with straight hair and features prominent, and of a strong Jewish cast. The body is marked on each shoulder with a shield-like device, and on each breast is generally a mark in the shape of a heart, very neatly executed. The large cicatrices which appear on the bodies of the tribes of Southern Australia are not used here; nor is a front tooth taken out at the age of puberty. The septum of the nose is pierced, and the crescent-shaped tooth of the dugong is worn in it on state occasions; large holes are also made in the ears, and a piece of wood as large as a bottle-cork, and whitened with pipeclay, is inserted in them. A practice of cutting the hair off very close is followed by both sexes, seemingly once a year, and wigs are made of the hair. These are decorated with feathers, and worn at the *corrobories* or gatherings. The women hold, if possible, a more degraded position than that generally assigned to them among the Australian aborigines. They are, indeed, wretched creatures. The only covering worn by them is a narrow belt of twisted grass, with a fringe of strips of palm-leaves in front. The men go entirely naked. The aborigines make no huts. In wet weather a rude screen of leafy boughs, with palm-leaves—if any happen to grow in the neighbourhood—is set up as a shelter.

The arms used by these natives are few and simple. Four sorts of spears, made from the suckers of a very light wood tree with large pith, headed with hardwood and generally topped with bone so as to form a point or barb, are the most common. The end of the tail of a species of ray-fish is sometimes used as a point. It is serrated and brittle, and on entering any object breaks short off. It is said to be poisonous, but I do not believe such to be the case, as one of the marines stationed here was speared in the shoulder with one of these spears, and no poisonous effect was produced. The point, which broke short off, however, remained in the wound and could not be extracted for many months. The spear most commonly in use, and the most effective, has merely a head of very hard wood, from a species of acacia, scraped to a very fine sharp point. These are the only spears which can be thrown with any precision to a distance—they are sent with considerable force. I extracted two from the thigh of one of my horses; the animal had another in the shoulder, which had entered to a depth of five and a half inches. All spears are thrown with the *wommer*, or throwing-stick. A rudely made stone tomahawk is in use among the Cape York natives, but it is now nearly superseded by iron

axes, obtained from Europeans. I have seen no other weapons among them; the boomerang and nulla-nulla (or club) are not known.

The greatest ingenuity which the natives display is in the construction and balancing of their canoes. These are formed from the trunk of the cotton-tree (*Bombax*), hollowed out. The wood is soft and spongy, and becomes very light when dry. The canoes are sometimes more than 50 feet in length, and are each capable of containing 12 or 15 natives. The hull is balanced and steadied in the water by two outrigger poles, laid athwart, having a float of light wood fastened across them at each end, so that it is impossible for them to upset. A stage is formed on the canoe, where the outriggers cross, on which is carried the fishing gear, and, invariably, also fire. The canoes are propelled by short paddles, or a sail of palm-leaf matting when the wind is fair. Considerable nicety is also shown in the making of fishing-lines and hooks. The former are made from the fibres of a species of climber, very neatly twisted. The fish-hooks are made of tortoiseshell or nails procured from wreck timber. They are without barbs, and our fish-hooks are eagerly sought for in place of them.

The food of the natives consists chiefly of fish, and, in the season, turtle, with roots and fruits. These latter and shell-fish it is the business of the females to collect and prepare. They may, however, be truly said to be omnivorous, for nothing comes amiss to them, and the quantity they can consume is almost incredible. I have seen them luxuriating on the half-putrid liver of a large shark, cast up on the beach; the little black children scooping up the filthy oil, and discussing it apparently with the greatest gusto.

These remarks apply to the four tribes which inhabit the territory within the limits mentioned at the commencement of this Report—viz., the peninsula to the northward of the Kennedy River. These four tribes are not distinguishable from each other by any distinct peculiarity that I can perceive. They keep each to their own territory, except on the occasion of a grand "corroborie," when the whole assemble. They are at present on terms of peace nominally. Should a safe opportunity of cutting off a straggler offer, I have no doubt it would be taken advantage of. They are cowardly and treacherous in the extreme. The "Gudang" tribe, claiming the land from Cape York to Fly Point, at the entrance of Albany Pass, is small in numbers, having, I fancy, been seriously thinned by their neighbours, the "Kororegas," from the Prince of Wales Island, in Torres' Straits, who frequently come down upon them. Paidá, Mr. McGillivray's *kotaiqa* (friend), was not long since killed by them. The "Goomkoding" tribe, who live on the north-western shore, I have seen little of. They and the "Gudang" seem to hold most communication with the islanders of Torres'

Straits, the intermixture of the races being evident. "Kororega" words are used by both these tribes, and the bow and arrow are sometimes seen among them, having been procured from the islands. The "Yadaigan" tribe inhabit the south side of Newcastle Bay and the Kennedy River; the "Undooyamo," the north side. These two tribes are more numerous than the two first-mentioned, and appear to be of a more independent race than the others, and gave us much trouble, on our first settlement, by continual thefts, and otherwise. The tract of country which they inhabit is nearly covered with the densest scrub, and with swamp, into which they took refuge with their booty as soon as any depredation was committed, so as to render it next to impossible for us to pursue them. These four tribes together do not number in all more than from 250 to 300 men.

All these people are much addicted to smoking. Tobacco is used by them in preference, when it can be got. Before its introduction, or when it is not procurable from Europeans, the leaves of a large spreading tree, a species of *Eugenia*, was and is still used. These leaves must possess some strong deleterious or narcotic property. I was for some time puzzled to assign a cause for so many of the natives being scarred by burns. Nearly every one shows some marks of burning, and some of them are crippled and disfigured by fire in a frightful manner. They smoke to such excess as to become quite insensible, and in that state they fall into their camp-fires, and receive the injuries mentioned. The pipe used is a singular instrument for the purpose. It is a hollow bamboo about  $2\frac{1}{2}$  feet long, and as thick as a quart bottle. One of the smoking party fills this in turn with smoke from a funnel-shaped bowl, in which the tobacco is placed, by blowing it through a hole at one end of the tube. When filled it is handed to some one who inhales and swallows as much of the smoke as he can, passing the pipe on to his neighbour. I have seen a smoker so much affected by one dose as to lie helpless for some minutes afterwards.

Thus much for the general appearance and habits of the Cape York natives. A very accurate vocabulary of their language has been published by Mr. M'Gillivray in his account of the voyage of H.M.S. *Rattlesnake*. Of their superstitions I am unable to speak with certainty. That they have no belief in the existence of a Supreme Being is, I think, positive. They are, like all the Australian tribes, averse to travelling about at night, if dark; this, I believe, chiefly arises from the inconvenience and difficulty of moving about at such times, and not from any superstitious fear. They travel when there is moonlight. They are true observers of the weather, and before the approach of a change, move their camps so as to obtain a sheltered position. They



do not seem to give the slightest thought to cause or effect, and would, I believe, eat and pass away their time in a sort of trance-like apathy. Nothing appears to create surprise in them, and nothing but hunger, or the sense of immediate danger, arouses them from their listlessness.

The Banks and Mulgrave Islanders in Torres Straits seem to be of a more savage nature, although intelligent, and giving considerable attention to the cultivation of yams, bananas, &c. Both the good and bad features in their characters may, I believe, in a great measure be attributed to the strong influence exercised among them by a white man, called by the natives "Wini," who has been living there for many years. This man, who is supposed to be an escaped convict from one of the former penal settlements in Australia, no doubt considers it politic to keep Europeans from visiting the island where he resides and which is called "Badu." The natives of Cape York hold him and the Banks Islanders generally in the greatest dread, giving me to understand that all strangers going there are killed, and their heads cut off. The latter appears to be the custom of these and the natives of the neighbouring islands towards their slain enemies.

The natives of the islands more to the northward and eastward are said to be of milder dispositions, especially the Darnley Islanders—of whom Captain Edwards, of Sydney, who had a "Bêche-de-mer" fishing establishment there during the last year, speaks in high terms as being of friendly dispositions and displaying very considerable intelligence, living in comfortable huts and cultivating yams, bananas, cocoanuts, &c., in considerable quantities. Among these islanders I should think missionaries might establish themselves without great difficulty, and with a satisfactory result.

I think that the simple fact of a settlement of Europeans being established at Cape York will very much tend to curb the savage natures of the natives, not only of the mainland but also of the islands, and any unfortunates who may be cast among them from shipwrecked vessels will, at all events, have their lives spared; and I believe that, should such an event take place, I should soon hear of it from the natives here. The communication between the islanders and the natives of the mainland is frequent, and the rapid manner in which news is carried from tribe to tribe to great distances is astonishing. I was informed of the approach of H.M.S. *Salamander*, on her last visit, two days before her arrival here. Intelligence is conveyed by means of fires made to throw smoke up in different forms, and by messengers who perform long and rapid journeys.

From what I have previously said of the soil here, it will be seen that no large portion of it is suited for agriculture. Even

were the land good, the peculiar climate, which may be considered dry for eight months in the year, would not permit satisfactory cultivation to any large extent. During the rainy months, from December to April, vegetables suitable to the temperature may be grown in abundance.

Of the agreeableness and salubrity of the climate of Somerset, I cannot speak too favourably. The wet season commenced here last year (1864) with the month of December, and continued till the latter part of March. During that time the rain was intermittent, a day or two of heavy wet being succeeded by fine weather. The winds from the north-west were light, and falling away to calm in the evening and night. During this season the highest range of my thermometer was  $98^{\circ}$  in the shade; but it very rarely exceeds  $90^{\circ}$ . During the calms immediately succeeding wet, the heat was disagreeable, and mosquitoes appeared, but not numerously. The nights were invariably cool. The weather for the remaining seasons of the year may be termed enjoyable. A fresh bracing breeze from the south-east blows almost continually, the thermometer averaging during the day from  $80^{\circ}$  to  $85^{\circ}$ . This temperature, with the cool nights (sufficiently so to render a blanket welcome) and delightful sea-bathing, prevent any of the lassitude or enervating influence, so common to tropical climates elsewhere, from being felt at Somerset.

During the time of my residence here, no serious indisposition has occurred among the European residents. Occasional slight attacks of illness, generally traceable to some cause, has taken place, but, as far as can be judged, there is no *local malady*. There has been no symptom of fever or ague, which it was apprehended would be prevalent during the rainy season, as in other hot countries. Dr. Haran, R.N. (the naval surgeon in charge) reports very favourably of the salubrity of the climate. I have every reason to believe, with Dr. Haran, that, at no very distant period, when steam communication through Torres Straits shall have been established, Somerset will be eagerly sought by invalids from the East, as an excellent and accessible sanatorium.

At all events, there can be no doubt but that the new settlement will fulfil admirably the objects for which it was founded, *i.e.* as a port of call and harbour of refuge for trade in the dangerous navigation of Torres Straits, and as a coal depôt for steamers.

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VI.—*Ascent of the River Purús.* By W. CHANDLESS, Esq., M.A.,  
Gold Medallist R.G.S.

*Read, February 26, 1866.*

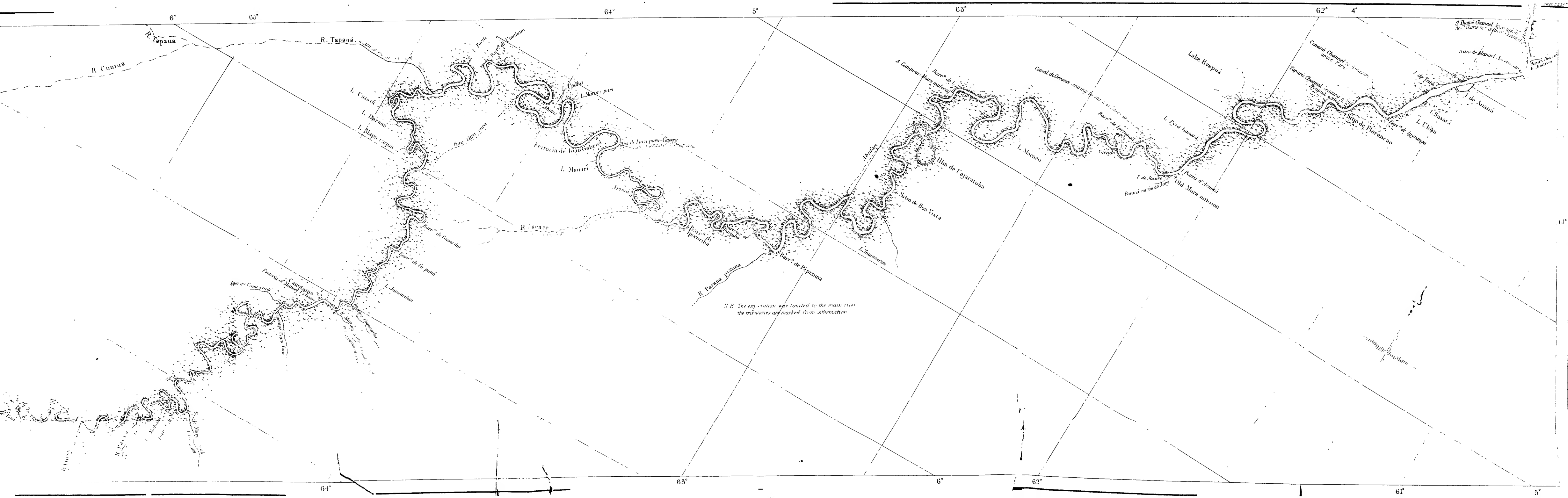
As the Purús is one of the least known of the great tributaries of the Amazon, perhaps no apology is necessary for my offering these notes (imperfect as they are), chiefly the results of a journey on it from June, 1864, to February, 1865.

In modern times there have been four explorations of the Purús, ordered by the Brazilian Government. The first, many years ago, conducted by one João Cometá, reached only the mouth of the River Ituxy, about 700 miles\* up; and both this and the following expedition succeeded far more, by mismanagement and misconduct, in giving offence to the Indians than in accomplishing any useful purpose. The second, in 1852, conducted by one Serafim, a Pernambucano, went well supplied with provisions and men, including twelve soldiers, and ascended the river for about 1300 miles, but, except the names and apparent size of a few of the tributaries, and the important fact of the absence of rapids, it brought back no information of value; the report being filled principally with a string of Indian names of the different sandbanks—utterly useless—and no attempt having been made to determine distances, except by days' journeys. The third expedition, in 1860, was conducted by Manoel Urbano, a mulatto, a man of slight education, but great natural intelligence. As a proof of his acuteness I may mention that he had found out for himself that rocks were deposited by water in a soft state, from observing fossil foot-prints in the rocks on the banks of the Amazon, at Manacapuru, where he lives. By great tact, firmness, and courage he has acquired an extraordinary influence among the Indians of the Purús, and is well acquainted with many tribes and their languages. I have said thus much about him, because a great deal of the information, especially about the Indians, which I have obtained has been gathered from him; and absolutely *all* that is known of the tributaries of the Purús, excepting the first three, is known from his information. His expedition was sent not to explore the Purús, but to discover a water-communication, rumoured, though on no real grounds, to exist between the Purús and the Madeira, above the rapids of the latter river, which it was thought might thus be avoided. Unfortunately the year was a singularly dry one, and all the rivers, including the Amazon, fell much below their usual low level: thus successively on each tributary Manoel Urbano was stopped by want of

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\* Where miles are spoken of, English miles are to be understood.



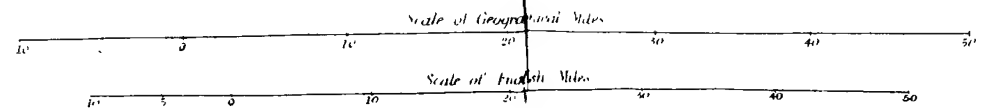


water; nevertheless he ascended the largest, the Aquiry, for twenty days, and the Purús itself for some 1600 miles. Though anything like an exact knowledge of the course of the river was naturally impossible where no compass was used, yet from the rising of the sun he had formed a much better estimate of the general course than I should have thought possible in so tortuous a river, and not a bad one of the distances in leagues. But from ignorance of the geography of the surrounding countries he mis-understood much of the information given him by the Indians; so that in the official Report of his journey (drawn up by a person of education) the important fact that he was not far from the river Ucayali was omitted, while the extraordinary statement that the Indians had told him he was near the *Bolivian* town of Sarayácu—as he supposed, on the Purús—found place.

In consequence of the interest excited by Manoel Urbano's journey, the Brazilian Government, in 1862, sent a steamer up the Purús. Much was expected of this fourth expedition, but little was accomplished. Firewood had not been prepared for any great distance, so the steamer was continually delayed, and also being slow, it ascended slowly. Finally, having spent about forty days in travelling little more than 800 miles, the expedition turned back ingloriously, having found nowhere less than  $7\frac{1}{2}$  (Brazilian) fathoms in the channel. Strange to say, no astronomical instruments, and consequently no astronomical observations were taken: in fact, I believe not a single astronomical observation had been taken on the Purús before I entered it. Among several gentlemen who voluntarily accompanied the expedition was Mr. Wallis, a German naturalist and very able draughtsman. Mr. Wallis, disappointed, as all on board were except the commander, at the premature termination of the voyage, with great spirit started up the river in a canoe (when the steamer turned back), though utterly unprovided for such a journey. Unfortunately his canoe was small and leaky, and overloaded, and, a few nights after starting, it sunk in deep water, by which he lost his whole stock of provisions, besides other property. Subsequently, by great imprudence in drying gunpowder, he was most severely burnt, but still kept on till about ten miles above the river Pauyuni. Mr. Wallis has, I believe, sent a narrative of his journey to Europe; but to what country I am ignorant. His drawings of the fish of the Purús are admirable, and stand perfectly the severe test of recognition by boatmen and Indians.

Apart from any geographical interest, the Purús has in the last eight or ten years become much more known and important, owing to its richness in vegetable products, chiefly india-rubber, sarsaparilla, and balsam of copaiva: also in nuts and cocoa (cacao). Sarsaparilla is most abundant from 700 to 1000 miles from the mouth; copaiva on the various tributaries; india-rubber from 200

MAP OF THE  
RIVER PURUS,  
FROM NEAR ITS SOURCE TO ITS MOUTH



1. The first step is to identify the variables involved in the problem. In this case, the variables are the number of hours worked (H) and the number of hours of sleep (S).

2. The second step is to write down the objective function, which is the function that we want to maximize or minimize. In this case, the objective function is the utility function, which is a function of H and S.

3. The third step is to write down the constraints, which are the conditions that must be satisfied. In this case, the constraints are the budget constraint and the time constraint.

4. The fourth step is to solve the problem using the method of Lagrange multipliers. This involves writing down the Lagrangian function, which is a function of H, S, and the Lagrange multipliers, and then finding the values of H and S that maximize the Lagrangian function.

5. The fifth step is to check the second-order conditions to ensure that the solution is a maximum.

6. The sixth step is to interpret the results of the solution. In this case, the results show that the optimal number of hours of sleep is 8 hours, and the optimal number of hours of work is 16 hours.





miles up to as far as any one has gone in search of it, say 750 miles: from 200 to 400 miles is the district where the greater number of india-rubber makers locate themselves. The dry season, June to November, is the time of work; and at the beginning of this a large number of canoes go up river. In 1864 more than 20,000*l.* worth of goods entered the Purûs, including, however, in this provisions, chiefly mandioca-flour. During the last few years the population of this province has turned more and more to the extraction of natural products, and away from agriculture, as the following statistics (from the official Report of duties paid) will show:—

	Arrobas, of 32 lbs.		Arrobas.		Arrobas.
1861.—Sarsaparilla	1793 ..	Cacao	9,936 ..	India-rubber	16,777
1863-64* ..	3092 ..	„	14,100 ..	„	36,625
Balsam of Copaiva is not given.					
1861.—Coffee ..	630 ..	Tobacco	1187		
1863-64* ..	222 ..	„	778		

In the same period mandioca-flour has more than doubled in price (from 38000 to 68000—6*s.* 9*d.* to 13*s.* 6*d.*—per basket at least; and it is *now* occasionally at 88000 or 108000—18*s.* to 22*s.* 6*d.*), and is largely imported from Pará, this province (Amazonas) not being now self-supporting.

The great difficulty of travellers in these parts has usually been the obtaining a crew. Fortunately I managed to hire some Bolivian Indians, who had come down the Madeira and on to Manaus for work, as a good many now do, on account of the higher price of labour here. They are superior to the Brazilian Indians, as they do not desert: on the other hand, they are more obstinate and mutinous, and equally lazy, though in a different way. It is but right to mention that the authorities here, and especially the President of the province—despite the then recent differences with the British Government—showed the greatest desire to assist me in my journey, so far as lay in their power; consequently I carried orders to the Directors of Indians on the Purûs to furnish me with men, should I require them: as, however, my Bolivians stuck to me, I did not require them—a fortunate circumstance, since on the Purûs, as a rule, the Indians care but little for the Directors, and the Directors as little for the Government.

On June 12th, 1864, I entered the mouth of the Purûs (there are three other channels, two leading to the Amazon above the mouth, and one below; but from their small size they can hardly be called mouths): the water here had ceased to rise; but I found the first

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\* The financial year of this province has been altered, and now begins on July 1st, as in the rest of Brazil, instead of coinciding with the civil year as in 1861. Cocoa, it may be well to add, is nearly all wild; the plantation cocoa of the province of Amazonas being less than 200 arrobas.

sign of an ebb at 120 miles up on June 21st—about 600 miles from the mouth, the fall, as I ascertained, began in the last days of April. This great difference is doubtless caused in part by the bends of the river, and one or two narrows, which serve to hold up the water, and near the mouth sometimes by the height of the Amazon; but probably depends more on the fact that when the Purús is full the first two large affluents, the Paranápixuna and Tapauá, are completely held back; consequently their water accumulates till the Purús begins to fall—the lakes also serve as reservoirs. Near the mouth the flood of 1864 was less than that of 1863 by about 6 feet; but above the island Uajaratuba by only 18 inches; and above the Paranápixuna the difference was insensible.

The Purús flows through a valley of “varzea.”\* Here and there the “terra firme” touches on the river, generally terminating in cliffs (barreiras), sometimes of considerable height: the upper part of these always consists of red or yellowish-red unstratified clay, with varying beds of stratified sand, and clay below, the latter often of brilliant colours. These beds are frequently inclined, though never greatly so; and in some cases the lower have been denuded before the upper were deposited. It seems probable that the red clay of the terra firme was formed from the denudation of granitic rocks surrounding the basin of the Purús, or rather of the Purús and the rivers to the west of it. In the little gutters formed by rain at the foot of the cliffs I have often found small rounded pieces of quartz. All information tends to show that the region from the Madeira to the Ucayali, which on the Purús to lat. 9° s. has but a slight elevation, formed, long after the land to the east was above water, a great basin or lake; in the opinion of Dr. Coutinho, the government engineer here (who having travelled on the Tapajos, Madeira, Upper Amazon, and Japurá, and on the Purús as far as the steamer went, is able to form a good idea of the whole district), a lake of fresh water: the abundance of fossil-wood and fragments of bone in parts of the Purús, would, I suppose, tend to confirm this view. The upper part (10 ft. to 20 ft.) of the varzea, as of the terra firme, is unstratified: the lower consists of beds of yellow or blueish-yellow clay, mixed more or less with earthy matter, and by no means of the compact nature of the clay of the terra firme. The land on the convex side of the river—and the Purús seldom runs straight—is almost invariably igapó; but never that on the concave side: when the convexity changes sides, so does the igapó. This strikes

\* The terms “terra firme” (Portuguese), “varzea,” and “igapó” have been so frequently used by writers on the Amazon, that an explanation of them is scarcely necessary. The first is the land high above the river level; the second, land occasionally flooded at high water, but never to any depth; the third, land always in time of flood many feet under water. The vegetation of these three is naturally very different, as has been fully explained by various writers.

one entering the river in time of flood ; but when the river is low the explanation is clear, as this igapó then extends out into a sand-bank, often reaching half or more across the river, and obviously has been formed by the river in quite recent times, which, as it eats away the varzea on the concave side, increases and raises the sandbank till it reaches a level suitable for vegetation : in fact, where the river is straight for any distance there is neither sand-bank nor igapó. The edge of the vegetation is bounded by the *uirana*,\* a tree of the willow tribe, with imbübas and large coarse grass behind. In some cases, owing to some obstacle on the concave side, the current has been turned across, and carried away the sandbank and even part of the igapó, leaving a cliff 10 ft. to 20 ft. high, or more, all but the surface-soil consisting of sand like the sandbanks. Accordingly, the jauari-palm, that likes sand, grows abundantly on the igapó : on the other hand, the mirití is very scarce on the Purús, because the varzea is too high above the summer level of the water, and the igapó too sandy. The extent of the igapó shows the enormous change in the bed of the Purús within very recent times. The causes of this and the great tortuosity of the river are not far to seek. The soil of the varzea is soft and readily eaten away. Another cause, perhaps more efficient, is, that the surface-water percolates downwards till it reaches the clay beneath, and along this makes its way to the river, thus causing immense landslips, on a small scale, resembling those of the Isle of Wight. Thus the tortuosity is constantly increasing till the river breaks through an isthmus and cuts off a bend. One such cut-off, 140 miles up, was made only ten or twelve years ago (exact dates it is impossible to obtain) : another† just above the River Mamoria-mirim, about thirty years ago : Manoel Urbano recollects this latter with an isthmus 60 yards wide, as an excellent place to watch for game entering or leaving the peninsula. The Indians recollect or report from tradition others ; and many more are obvious to the eye. where in very sharp bends the land on the inner side has the form of half a section of a bi-concave lens ; and opposite one can trace the curve of the old river-bed as along the dotted line, by the varzea ; between which now is igapó on the new river-bank, with two small mouths still remaining. The old bed rapidly fills up near the mouth (or cut-off) by the detritus brought in by the river ; but as there is no current to carry this far in,

\* Two trees, common on the banks of the Amazon, are called *Uirana*. The one is a true willow (*Salix Humboldtiana*, Willd.), the only species known in hot equatorial plains ; the other is a small bushy tree, with leaves like our willow, but it belongs to the fig tribe, and is a species of *Morhu*.—[Note by R. SPRUCE, Esq., F.R.G.S.]

† The river has now retired about 400 yards from the point of the island cut off, leaving a channel that is being silted up to connect the lake and river.

the rest remains as a lake; and no doubt many of the lakes of the Purús, which are very numerous, were so formed; though others, being too large for this cause, may correspond with some natural depression of the ground. Another marked feature of the Purús is its comparatively slight variation in width, and the absence of islands: of these there are but seven in all; four of some size, all in the first 200 miles, and three small ones. This description—I fear tediously long—will apply to the whole river, excepting that from 1200 miles or so up the terra firme approaches the river and narrows the varzea; yet even far above it is never found at the same point on both sides of the river.

On the lower part of the Purús, when full, it is somewhat hard to get a living; but above (say 300 miles) food is more abundant: motuns of monkeys (coaitás and guaribas) in the wood are seldom wanting. When the river falls, wild geese return from their migration to breed here. In July gaivotés' eggs may be picked up by scores on the sandbanks: the gaivote is a gull; its nest is merely a round hole in the sand, almost always where this has an upper coating of mud, and therefore does not drift with the wind, about four inches across and three deep; the eggs, three or four in each nest, are of a dirty light-green or brown, with patches as of dried blood—when fresh they are very good eating, and much like puffins' eggs. In August the smaller turtle (tracaja) lays; and in September the turtle: occasionally one finds fresh eggs even in the middle of October. It is to be remarked that the seasons on the Purús are considerably earlier than on the Amazon; and this applies to fruits also: the assái is ripe in January on the Purús; on the Amazon not till February or March; on the latter the first week in November is the time for making oil of turtles' eggs, on the former at that time the young turtles are hatched. Along the edge of the sandbanks fish are abundant, particularly of the kinds pirarara, surubim, and peixe-lenha (or firewood fish), all species of *Pimelodus*; also alligators and ray-fish; so that between these and piranhas bathing is not very safe. It would be well if there were no worse plagues; but in parts, between pium-flies all day and mosquitoes all night, rest is almost impossible, and one is driven to and fro as if between the gate of Hell and Acheron. These may seem trifles, but they seriously diminish the numbers of settlers: many have told me that but for piums they should stay the whole year up-river: as it is, there are but half-a-dozen settlers, and only one of these within the country of the piums, which, like the india-rubber trees, are not much found below the island of Uajaratuba. The piums at times cause very tiresome sores: I have seen persons completely lame from them; and at one time myself had nearly twenty large festers on one arm. Bleeding is the most common, and undoubtedly an efficacious

remedy; and the sap of the ocaüba-tree\* is an excellent salve for these or any other festering sores: though this is clear and red, people call it ocaüba-milk; for as the sap of the india-rubber tree is like milk, and this is to them the most important tree, they call the sap of all trees milk. The Purús now is a very healthy river; but some eight years ago fever was so prevalent and severe one season, that the following year four or five men only ventured up the river. Ague is prevalent on all the black-water tributaries; whether from drinking the water, or from other causes is a disputed point. On the upper Purús the men of the canoe that accompanied me, fancying the water of the river brackish, took to drinking water from the small streams, and several were attacked with ague, which left them when they left off the black water; and none of the men of my canoe, who all drank river-water, suffered: as, however, on the highest part of the Purús all of the other canoe, without exception, suffered severely from ague, while two of my Bolivians escaped, and two more had it but slightly, this result can hardly be deemed decisive.

There is little of interest, and nothing of importance, in the personal details of a journey up the Purús; therefore I omit them. On July 7th I passed the River Paraná-pixuna, the first affluent, the black water of which I met unmixed more than three miles below, and at a mile's distance occupying a considerable portion of the river. The same phenomenon occurs on a greater scale with the Rivers Negro and Amazon. Dr. Coutinho tells me he has seen the River Negro water below Serpa still unmixed. All the information I have received negatives the existence of a *water-communion* from the Paraná-pixuna to the Madeira, below Cratto, as marked in many maps, and agrees in giving two or three days' journey by land. The Indians thus far, and there are but a few of them, are Muras, a tribe ill-famed here and wherever they are known (as on the Amazon and Madeira), being indolent, drunken, dishonest, and prone to acts of violence. There is no doubt that attacks on canoes on the Madeira have at times been made by the Muras, while Araras, and others, have got the credit. Above the River Jacaré, a small affluent, though with a large mouth, begins the territory of the Pammarys. The Pammarys and Juberys are merely subdivisions of the old tribe of Puru-purús, which name is extinct. They speak the same language; are the same in habits and appearance; and are alike afflicted with an unpleasant skin-disease: whether this be hereditary or not is doubtful—children of two or three years old are generally still clean. Some Indians of other tribes, and one white trader, have caught

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\* Oca-üba, or *U-u-üba*, is the general name for the *Myristica*, or nutmeg-tree, whose sap is reputed a vulnerary.—[R. S.]

it; but it is certainly not communicated by mere ordinary contact. The Pammarys are a very peaceable race: deaths by violence, and even severe wounds or blows, are almost unknown among them. They are a merry, good-humoured set, fond of and famed for singing: their songs have in general much of the wild effect of a bagpipe heard at a distance. Their agriculture is but slight: they plant bananas, aipim, and mandioca, but do not make mandioca-flour, though they are fond of it, and try to obtain it from traders. They are essentially a water-side tribe, good at fishing, and shooting (with arrow) fish or turtle, but very unskilled in shooting game, and generally in shooting upwards. Traders employing a whole village of them have frequently received from 200 to 300 turtles from a single day's work. I have counted more than sixty canoes floating down river together in chase of turtle, each with a woman steering and an Indian standing like a statue in the bow of the canoe watching for turtle rising. The regular price for a turtle is one barbed iron arrow-head, or two unbarbed; but when the river is in flood they ask more. In the dry season they live mostly on the sandbanks, making huts of palm-leaf mats when they stay long in one place; but when moving, they content themselves with fixing in the ground boughs of the uirana tree, as a shade. In the time of flood they retire to the lakes, and make their mat-huts on rafts, moored in the middle to avoid the mosquitoes. A Pammary village has then rather a striking appearance. So far as I have seen—and I have not seen the same in the case of any other tribe—each family always lives in a separate hut, and each hut stands on its own raft: the interior is arranged very neatly; and generally there is at least one large green trunk, an article they are very ambitious of owning, even if they have nothing to put in it: this, however, is not often the case. They now work to a great extent, though lazily, at collecting india-rubber, and well understand the value of it, and of what they receive for it; though like all Indians they will pay ridiculous prices for things they take a fancy to. Portuguese axes they now refuse, and ask for American. They trade with other tribes, selling chiefly worn-out knives, axes, &c. They are very imitative in their tastes. I knew an instance of two Pammarys being left in a canoe with a carboy half full of vinegar, and drinking an enormous amount of it, believing it was wine. No one now would leave them with spirits in reach, as, thanks to the traders, they have learnt to get drunk on every possible occasion. In general they buy and wear clothing; but those who have bought none use the “tanga” only, and that a very small one; the women a piece of cotton cloth fastened round the hips. The Pammarys belong exclusively to the Purús, and are not found even half-a-dozen miles up any affluent.

On the River Tapauá, as one of the very few persons acquainted with it informed me, are the Cipós, a small and friendly tribe, very industrious, and generally with a stock of mandioca-flour on hand: they are said to be good linguists. The Tapauá, at no great distance from its mouth, has a large affluent on the right, the Cuni-uá, which accompanies the Purûs more or less. The main Tapauá cuts across the line of the River Coary and River Teffe, which are commonly represented as much longer than they are in fact, and rises near the River Juruá, to which, or to some tributary of which, Indians pass from the Tapauá. At  $1\frac{1}{2}$  mile from its mouth the Tapauá approaches the Purûs within 200 yards, and there is a second mouth here, a small channel, up which occasionally the Purûs water runs. As, however, the water is never sufficient to affect the water of the Tapauá, I have not considered the island between the two mouths an island of the Purûs.

Towards the end of July I reached the River Mucum, and, 3 miles above, Canotama, Manoel Urbano's "feitoria," as the shed of any one who brings up one hundred pounds' worth or so of goods is pompously styled. Here I was delayed more than a fortnight waiting for one of his sons, who had accompanied him on his expedition and afterwards accompanied me, but was now absent. It was necessary to have with me some one who could speak the language of the Hypurinás, the tribe next above, and very desirable to strengthen my party by the addition of a second canoe. Subsequently, finding my stock of mandioca-flour too small, I had to return 150 miles down river to another "feitoria" to buy more. It was during this journey that I observed an occultation near the mouth of the River Tapauá.

At Canotama, 3 feet above the high-water line, the barometer (mean of 16 days at 9 A.M. and 3 P.M.) stood higher than in Manaos at about 10 feet above the high level of the River Negro, at the homologous hours. Similarly Mr. Wallace\* remarks that as far as his observations extended, the barometer stood higher at Manaos than at Pará. The difference at the high-water line and the level at the beginning of September was 0.048 inch (with the air at 80°); but the fall in 1864 was considered a small one. The "friagem," or cold weather, does not come here as on the Upper Amazon† in one spell of a fortnight or more, but in several of two to five days at a time, during May to August inclusive. Thus we had it on July 25th and 26th, August 8th, 11th, and 23rd and 24th. It was always ushered in by very violent thunder-storms the night before, after which the wind shifted to s.s.w.

In the district between the Purûs and Madeira, especially on the

\* 'Travels on Amazon and River Negro.' This and other works referred to, are quoted from memory, as I have none of them at hand.

† Cf. Bates' 'Naturalist on the River Amazons,' chapter on Ega.

Rivers Mucum, Marý, and Pacía, live the Catauixis, a fine handsome tribe, free from the Puru-puru skin-disease, and remarkably clear-complexioned. Warlike if attacked, and prompt to guard their own, they are by disposition peaceable and industrious—fond of agriculture and even of manufacture. Their mandioca-flour is very superior to that of the Amazon, as they do not extract the tapioca or starch; and their pottery, very neatly made and ornamented with geometrical patterns, is much prized on the Purús: in this and incarajuaro, a red paint, formed by a decoction of the leaves of the plant so called, they trade also with other Indians. At this time they were suffering much from catarrh, which is very fatal to Indians;\* and there had been not a few deaths from this cause. Not having been up the tributaries, I have seen of the Catauixis those only who have come down to the Purús, and they come but seldom. At the mouth of the River Marý I saw one who, though living but half a day's journey (down-stream) from the Purús, had never seen the river before, and was evidently much puzzled at the sight of it, and at the piums. The Catauixis are said to be given to hospitality—a virtue very rare among Indians.

In September, 1864, Manoel Urbano, sent by the Government, ascended the River Mucum for about a fortnight, and thence passed in two days overland (the return journey took but one day) to the River Madeira, near the Salto Theotonia, the third rapid, I believe, the sound of which he tells me he heard at night by the Mucum.†

At last, on September 5th, I started up-river. At this time the river was low and travelling easy, as the sandbanks, often a mile and occasionally 3 miles‡ long, serve as a towing-path; and as the Purús is a succession of bends, and in nearly every bend a sandbank surrounds the convex side, frequently in a day's journey of 15 or 20 miles we had but 2 or 3 miles of rowing, viz., in crossing from the end of one sandbank to the beginning of another. The sandbanks in this part and above have usually an even edge and a pretty uniform depth round it: those below the Barreira de Canarihá for the most part run out into projecting points and are cut into by deep gulfs, and therefore do not serve for towing. I do not know the cause of this difference.

The Marý and Pacía are small rivers closed in by the Mucum and a tributary of the Ituxy: the latter is a large river. It is by this that the Government hopes to find a communication with the

\* Cf. Bates' 'Naturalist on the River Amazons,' chapter on Ega.

† The Brazilian official report of this journey is translated in the Appendix to the next Memoir, p. 126.

‡ Serafim ('Travels of Cieza de Leon,' printed for the Hakluyt Society, p. 346) speaks of travelling along a sandbank or beach for 5 or 6 *days*. Apparently he lost his notes of the last 10 days of August. I have never spent as much as 3 *hours* along any sandbank on the Purús, south of lat. 6° s.



Madeira above the rapids. In respect of ague the Ituxý has the worst name of all the affluents: the Pamanás, a tribe on it, are said to be always suffering, and consequently very indolent and unwilling to work, whatever price be offered. At this time the Ituxý was low, and its water clear and only a light-brown. This is the case in summer with most of the black-water rivers. Its temperature was exactly that of the Purús.

Above the River Sepatynim and from this to the River Hyuacú, a distance along the river (omitting the bends) of nearly 300 miles, extends the tribe of Hypurinás, the most numerous, warlike, and formidable on the Purús. On the left side, at one or two days' journey from the river, are the Jamamadýs, extending inland of the Hypurinás for their whole length; but on the right not even the name of another tribe inland is known. Apart from all other distinctions, Indians in these regions may be divided into Indians of the land and Indians of the water. The Jamamadýs are exclusively a land tribe, living on small streams only, and not using canoes. The Hypurinás are also a land tribe, but less exclusively so, and following up the tributaries of the Purús, intersect the Jamamadýs. Those near the river-bank, as far as about half-way between the Pauynim and the Aquiry, are now peaceable, and work most years, more or less, in the extraction of sarsaparilla with Manoel Urbano (or his sons). Even these, however, always make their houses at least a couple of miles inland, and those living farther up have their villages seldom less than a half-day's journey from the water. Their houses are generally very long, and somewhat narrow and low: the side-walls and roof are one, the poles being fixed in the ground converging upwards from the opposite sides, and being then bent together, so as to meet lower and form a pointed arch for the cross-section of the house; the thatch (of course) is of palm-leaves, and the ends are closed, leaving but small doorways, so that it is dark inside. In summer they frequently move nearer to the river-bank and make temporary sheds, just sufficient to throw the rain clear of the hammock, separately for each family. In these I have found them using charcoal for cooking, so as not to attract the pium-flies. They use bark canoes only, generally large enough to hold five or six persons, and the number of the canoes at the "ports" of the villages shows these to be large. The Hypurinás seem to delight in war, and to be constantly engaged in it (chiefly on those of their own tribe), with or without cause—frequently, indeed, sending a challenge. I have seen many among them with fresh arrow-wounds. Some few use the "taquára," or arrow headed with bamboo, naturally poisonous; but more the "curabi," an unfeathered arrow with a poisoned head, notched and half cut through so as to break off in the body. The poison is compounded of the sap of

the "assacú" and other ingredients: they try it first with the small arrows of the blow-tube on monkeys. Salt is said to be an antidote to this and all Indian poisons. I am told that the Miranhas on the River Japuri carry each man his little bag of salt when they go to fight. Always expecting an attack, the Hypurinás rarely lays aside his bow, and naturally distrusts a stranger. A few words in their own language, however, have a magic effect, and the danger is at the first approach only: for if they do not then attack, they will not do so treacherously afterwards. This rule, however, does not hold good among themselves, and murders, as war, are common for the sake of a trifle.

When the turtles come out on the sandbanks, the Hypurinás from the interior come too. On most sandbanks we found them (or traces of them), and always armed; seldom, however, more than 15 or 20 together, and they never offered to molest us. I like the Hypurinás, for they are well-mannered, and have a certain air of self-respect about them. They are also clean: one who worked for a few days in my canoe, having a shirt, directly he espied a bit of soap, asked me for it, and at once set to work with it; whereas a Panmáry will scarcely ever wash his clothes, except by compulsion. In general the Hypurinás wear nothing but the "tauga," and the women a piece of cloth, those from the inland villages merely a leaf; the women seem to be little better than slaves, and before strangers do not venture to say a word. Polygamy, in most tribes the privilege of the chiefs, is common, and indeed general, among the Hypurinás. Possibly their continual wars may make an actual disproportion in the sexes, though when one party is completely victorious, neither woman nor child is spared.

Manoel Urbano tells me that these and all Indians have a belief in a Supreme or Superior Being, whom some call "Carimade," others "Jurimate." When asked if they have seen him, they reply, with somewhat of awe, that it is not given to every one to see Jurimate; and when seen, only a face is seen. One can well imagine how some Indian in the dimness and stillness of the forest fashions the image of a face, as Norna heard voices among the stones of Stennis. Indians, unless brought away as mere children, never lose their faith in Jurimate, however they may conform with the ceremonies of Catholicism: this they consider has nothing to do with them; they belong to Jurimate. All tribes have some funeral ceremonies, and bury, or place by the grave, food, urucú, &c. The Panmárys also light a fire from time to time over the grave. They leave their dead buried. The Hypurinás, after a while, when the bones are clean, take them up, and have a festival and a funeral oration; the orator taking up, *e.g.* the arm-bone, and saying, "With this arm he did." &c.—recounting the great deeds of the dead; after this they guard the bones carefully.

The Hypurinás paint themselves, chiefly in black, with the roast unripe fruit of the genipapa; but the pattern seems to depend upon individual taste. They are fond of snuff, which they inhale through a hollow bone from the palm of the hand; their snuff-boxes are made of snail-shells, the mouth of the shell being stopped with a piece of cockle-shell, and a small tube fixed in the top of the shell to pour out the snuff. "Ipadú" (coca) is still more indispensable, and they are seldom seen without a lump of it in their cheeks.

From the little River Aicinam upwards the Purús in the dry season is not navigable for large craft, as, though free from rapids, it has at intervals shallows with rock—generally yellow or claret-coloured sandstone if "in situ," or else heaps of the debris of the sandstone. In some places I found a sort of false conglomerate (concretions of clay taking the place of pebbles)  $1\frac{1}{2}$  to 2 ft. thick, overlying the clay, and overhanging considerably. In this, and occasionally, but rarely, in the sandstone, I have found small bits of petrified or semi-petrified wood; and on the heaps of debris the amount of this is astonishing. On one bank below the River Hyuacú were many large masses; one of about  $2\frac{1}{2}$  feet long, and apparently the entire thickness of the tree, originally about 18 inches, with the concentrical rings very perfect, but now very elliptical, with axes 5 to 3. The mineralogical character differs considerably; one piece was sufficiently silicious to strike a light. Fragments of fossil bone, usually much water-worn, are also common; entire bones scarce, but occasionally to be found. Now and then both bones and wood have a slight encrustation of iron pyrites, sufficiently decomposed to taste of sulphate of iron. Pieces of wood, black and apparently in part carbonised, commonly have an efflorescence of nitre or some similar salt. A piece rubbed clean had in a week or ten days a new efflorescence. Though these bones and pieces of wood are often found where the adjoining bank is varzea, it is clear they are relics of the terra firme, first left bare when this was carried away, then buried under the varzea, and now again left bare. One piece of fossil wood I found at the bottom of a bed of sand (about 4 ft. thick, interstratified with clay at the base of a "barreira"), the lowest 2 inches of which were cemented by oxide of iron. This wood, however, was in a different condition from any other specimen, as it consisted to a great extent of oxide of iron.

The Paunim and Inaunim, both large affluents, are entirely unknown; the former, the first river of white water, has a strong current at all times, both in high and low water. These rivers cannot, however, come from any *very* great distance, being shut in between the Purús and Juruá. The Aquiry is still more important, and of this I shall treat in the sequel. The jauari palm extends on the Purús 15 or 20 miles only above the mouth of the

last-named. Perhaps the soil of the igapó contains too much earthy matter, as the Purús water is in flood-time far more muddy before being diluted by the Aquirý. Between this and the Hyuacú (and above) we found another palm, hitherto unknown, I believe.\* The tree very nearly resembles the Cayano† (or Dem-dem), well-known on the Amazon, and, like that, from year to year increases its bulk and not its height. Each fruit, which is (roughly speaking) round, and about the size of a man's head, grows singly on the stem below the leaves, so close that sometimes it is not easy to cut the stalk. When the tree is very low I have found the fruit, on the tree, half buried in the ground. The fruit is hard and rough outside, and divided into numerous segments, each containing 2 or 3 seeds, the size of a small egg, very white and hard. When ripe it splits up. The Manetenerys eat the unripe seeds while pulpy, and the fleshy substance that encloses the seeds when ripe. They call the palm "Cayanaripa." This palm is not very abundant, and had escaped the notice of Manoel Urbano, who, however, found on the river Aquirý a similar species (differing only in the structure of the fruit). Mr. Wallis, who had heard of this, was very desirous of obtaining it. It may, therefore, be safely stated not to exist so low as the Pauynim.

The higher one ascends the Purús the more bamboo abounds in the forest, and "frecheira"‡ behind the sandbanks. This, very abundant on the Amazon, is scarce on the Lower Purús. It is of great use to the traveller, as in 10 minutes one can make a shed of it, sufficient to cook or sleep in.

Between the Aquirý and Hyuacú is a bend of the river about 3 miles round a peninsula, the isthmus being only 70 yards wide from bank to bank. Many more or less like this occur (and it is not to be wondered at that the dead reckoning occasionally anticipates the river, and makes a cut-off). Probably I should not have specially observed this, but for my seeing some Hypurinás drag their canoes across. On a sandbank not far above we found nearly 300 turtles rotting, having been turned by the Indians, and left in the sun, which soon kills them. On Oct. 18th I witnessed a somewhat unusual phenomenon: at 4.45 p.m. small clouds near the sun were fringed with pink, with a second fringe of green inside that, a light-blue occupying the centre of the cloud. A few gusts of wind, very violent, but lasting barely  $\frac{1}{2}$  minute each, swept across from

\* Plainly a *Phytelphas*, or Vegetable-ivory Palm; and it is quite possible that both of the forms mentioned in this paragraph are identical with the two species of *Phytelphas* that abound on the Ucayali and Huallaga, where the smaller of the two is called *Yarina* and the larger *Poboponto*. The Vegetable-ivory Palm of Guayaquil, on the Pacific coast, is a third species, known by the local name of *Culi*.—[R. S.]

† *Cayané* = *Elais arbutifera*, Gaertn.—[R. S.]

‡ So called, as the flower-stem serves for the shafts of arrows *frechas*.

s.w.; otherwise I noticed nothing peculiar. No rain fell during the day; the night was fine, but the sky misty.

The Hyuacú, as already stated, is the upper limit of the Hyipurinás. On it Manoel Urbano found the Canamary Indians agricultural and peaceful. They knew of iron by report, but then possessed none. They are on friendly terms with the Hyipurinás, and inter-marriages between the borderers are common. At that time they had a village with its port on the Purús (on the right bank); but we found the path choked with brush; so, clearly, they have moved. From the Hyuacú there is a considerable distance without Indians on or near the bank. It is said that on the left bank is a tribe called "Uainamarys," who were fired on by the second expedition, and in consequence retired inland. Some of my men said they heard, one night here, Indian music inland on the left. We found, however, very slight traces of Indians till we reached the sandbanks frequented by the Manetenerys from above, who make large huts of arrow-grass now in process of being washed away as the river was rising.

A week's journey above the Hyuacú we reached the point from which an Indian path leads to the Juruá (at the commencement of which path are a good many huts), and the following day the place where in 1861 was the first maloca, and where there is still a large plantation of bananas. The Manetenerys have now retired about 50 miles higher up the river, from fear of the Hyipurinás as well as we could ascertain, but at times they come down here to get bananas and visit sandbanks still lower down. From this village Manoel Urbano, at the request of the chief, brought away a young Indian woman, who being, or being thought to be, good looking, had been the cause of quarrels and murders, her husband having been killed first, and then his kin avenging his death. From her we had picked up the little of the language we knew. She gave 10 days' journey from the Purús to the Juruá, by the path just below, and having lived so near could hardly have been ignorant of the fact. Ten days, however, of Indian travel, with women and children, would not be more than 4 or 5 days for men alone. One of Manoel Urbano's men started from the river-bank at 7 A.M., and early in the afternoon passed the first halting-place. We could not ascertain whether the path reaches the main Juruá, or only a tributary. About half-way between this point and the River Aracá, opposite the remains of another deserted village, I observed the eclipse of the sun of Oct. 30th. As the difference of longitude of this and the mouth of the Aracá, by time observations on the return voyage depends only  $1\frac{1}{2}$  day on chronometer, the longitude of that mouth may be considered pretty nearly correct. On Nov. 1st and 3rd we passed malocas still inhabited, but the people of which were all up-river. We carried off a few things we needed

—bananas, tobacco, &c.—leaving payment in *iron* in their place. Exactly at the mouth of the Aracá we met these Indians returning down-river. Unlike the Hypurinás, they did not seize their bows, but came eagerly to us with tobacco, balls of cotton, thread, &c., asking for knives, fishing-hooks, &c. Even one knowing of the existence of these Indians, and of their comparative civilisation, cannot but be struck, after travelling for many weeks among naked and suspicious savages, with the sight of Indians still farther in the interior, and cut off from their natural channel of communication with the outer world; yet who wear clothes, and plant cotton and spin and weave it, both for their own use and for trade, and who show not the least fear but the greatest joy at the sight of strangers—unfortunately, it must be added, who meet the stranger with offers of children for sale, and with other offers such as travellers report to be made by the Polynesians.

It is probable that the Manetenerys have for many years traded on the Juruá,\* and perhaps direct with white men, to whom, however, they may be known by a different name: and the upper part of the tribe have, or have had, communication with the Ucavali. They always address one by the Portuguese “patricio” (countryman); they know, however, the Spanish words “muchacho” and “muchacha,” and call a knife “cuchero” (cuchillo). Of the “lingoa geral” I heard but one word, “pina” (fishing-hook), and that but once. Though eager for all articles of iron, they have a fair supply of them, and know perfectly the different values of a Portuguese and an American axe; they know also the value of their own cotton-cloth, and will not, as a rule, sell it except for iron—an axe, or knife, or pair of scissors, according to the size of the piece: very rarely for a looking-glass. This cotton-cloth is coarse, but well made, and excellent for hammocks, but unravels if cut diagonally as for clothes, unless protected by an extraordinary amount of hemming. It is very saleable among the india-rubber makers on the Lower Purús, at 1s000 per vara (= 43.3 inches). The Manetenerys would gladly trade down the Purús but for fear of the Hypurinás—and not without cause. In 1863, as we learnt from the Lower Hypurinás, two Manetenery canoes coming down loaded with cloth, were attacked, and the whole party killed by the Upper Hypurinás. The dress of the men is a long poncho, sewn at the sides, leaving only holes for the arms.† The women have two articles of dress, which may be described as sacks open at the bottom; one of these serves as a petticoat, the other they wear

\* Perhaps these have caught the Puru-puru skin-disease, from which nearly one-third of the tribe, or rather of those we saw, suffer: the Hypurinás are entirely free from it.

† The chiefs wear in addition a hood or cowl, perhaps in imitation of missionaries, whom they may have seen.

crumpled up, over one shoulder and under the other arm. The women seem to be on a perfect equality with the men. I have never seen them engaged in any but household work and loading the canoes; and they frequently scold the men, and interfere in their trade. Indeed, they seem to understand the privileges of their sex, and boarded our canoes, and laid hold of what they fancied, fearlessly. The whole tribe are thieves, and we rarely stopped even an hour among them without losing something. Worse still, they are as importunate and tiresome as can be conceived, always begging for small things, such as fishing-hooks, or beads, or salt, which last they are very fond of. As they did not ask for spirit, I suppose they are not acquainted with it. The Manetenerys are essentially a water-side tribe, always on the move up or down river, though they have their fixed habitations. Their canoes are ulás of cedar-wood, very long, and admirably made, but heavy from a great thickness of wood being designedly left underneath to stand bumps on rocks, &c. I have no doubt it was one of these canoes Lieut. Herndon\* reports to have been found on the Lower Purús, and which, from the excellence of the workmanship, could not have been made by Indians. Unfortunately, I cannot obtain his work here, and did not remember the name of his informant, so as to verify the fact. They travel up-stream almost entirely with punt-poles (of "frecheira"),† pushing along their canoes with great rapidity, even when the water is somewhat deep. One evening, my guide, in a light canoe with 7 paddles, had much work to keep ahead of an ulá with 3 men punting; and I, with 4 oars, was soon left far behind. When punting, the men generally take off their ponchos, and work naked.

From the point where we first met them they turned back up-stream with us, and for more than three weeks we had in general three or four canoes accompanying us: what was their exact reason for this I do not know; partly, perhaps, as a sort of escort or guard of honour; partly, I fear, to steal. We had thus much opportunity for observing their habits, but not much for learning their language, except by picking up a word now and then: if asked the names of things, they would invariably, after telling a couple or so, put their fingers into their mouth to imitate a fishing-hook, and whine out, "Juaynhi (fishing-hook), Patricio, juaynhi!" and whether one gave it or not, it was equally impossible to get another word from them on that occasion. They pronounce with remarkable

\* Mr. Markham ('Travels in Peru and India,' &c. refers to this in a chapter on the "Sources of the Purús."

† The punt-poles of the boatmen on the Huallaga are also of *Frecheira*, called there *Caña brava*: it is the *Gynurium saccharoides* of botanists. In the *mitos puros*, however, of that river, the *Caña brava* has to be substituted by poles made of the slender but exceedingly tough stems of *Bocagea Espiritana* (Spruce), a small tree of the Anonaceous or Sour-sop family.—[R. S.]

distinctness; and the sounds seemed to me to have nothing of that indefiniteness common in languages of uncivilised tribes; nor is the language the least guttural. Above, we found, as before, several houses without people, and the people either travelling or camped on some sandbank: in almost every case they turned up-stream with us, those who had come thus far remaining behind. Their houses (I should have said) are more ample, that is, wider and higher than those of the Hypurinás, and better made: they are always common to a good many families.

On one occasion, on a sandbank, I asked a chief to send a lad with us as pilot; but the chief understood that I wanted to buy a child, and going straight to a canoe dragged out one of ten years old, or so, crying bitterly, as did its mother, who clung to it. The chief, however, dragged them apart, and ordered one of his henchmen to hold the woman, and was evidently much disappointed on finding that his labour had been in vain. On November 9th we passed the little River Taramacá, by which the upper part of the tribe pass to the Juruá, but with a journey of how many days we do not learn. All the tribe seem to know more or less about the Juruá, but a few only about the Ucayali. One of the older men, however, told us the number of days still up the Purús, to where they drag their canoes across, spending two days in this labour, and thence ten days down the Ucayali to Sarayacu: the two latter numbers he always stuck to; but the first he varied according to fancy, sometimes increasing it after we had travelled farther up-stream. He spoke of a Padre Antonio, at Sarayacu, describing his tonsure, and imitated him saying mass, &c., repeating, or rather chanting (as distinctly as a European could), the words, "Espirito Santo." He knew of sarsaparilla, and told us there was none here, but that there was on the Lower Ucayali, and that "Padre Antonio" bought it: he also spoke of cattle, describing by signs their horns, &c.; and mentioned the names of the owners (two or three) of cattle-farms, "Don ——." &c. (I have forgotten the names.) He knew also the name Moyobamba. As a knowledge of our geographical position, especially in longitude, had enabled me long before to understand the true meaning of the muddled statement (before mentioned) brought back by Manoel Urbano, I was not astonished at this information. It is said in Mandos that this Padre Antonio is an Italian friar, who many years ago explored the Ucayali, and induced or forced a large part of the Indians to settle in villages; but that some, to escape this, left the Ucayali and settled on rivers to the east. Whether this be true or not I cannot say: but it accords well with what we saw and heard; and though I do not believe the whole tribe of Manetenerys, which is a large one, migrated here so late, yet it is very possible that this old man and others did so and amalgamated with this tribe. We con-



tinually gave him small things, fishing-hooks, arrow-heads, &c., and promised him a whole assortment of things if he would show us the portage; but I soon observed that he was suspicious, and afraid that we should take him down to Sarayacu by force: therefore I expected—as unfortunately proved to be the case—that he would stop short or mislead us. Manoel Urbano related that a very old Indian, whom we did not see, continually pointed to the east, saying, “Bení”—in fact, bored him with the name Bení—which he did not understand. I frequently questioned, but met with no one who seemed to have the least knowledge even of the name, and as it seems impossible that the Bení, or any branch it, should be near (from the latitude here, 9° to 9° 30' s., and that of the mouths of the Aracá, Hyuacú, and Aquirý, and their probable course and length), I can only suppose that this old Indian had once travelled far to the east.

Though the plantains we bought of the Indians were an assistance to us, yet as we could obtain from them no animal food, except now and then a tortoise, we fared very badly in this respect, the river being now too high for fishing, and all animals shy and even scarce near the river-bank, as generally is the case where Indians move about much; so that my crews fell off very much in strength, and our progress became slower. Once here, we got a good meal, in a curious way: coasting round a sharp turn we came suddenly on an alligator that had just laid hold of a large fish (tambakí), which it dropped in fright, and which we picked up, badly wounded, and floundering on the top of the water. My Bolivians were very patient; but the Pammarys Indians, who formed my guide's crew, accustomed at home to fare on turtle every day, became very discontented. This induced him to buy an Indian ubá at the last Manetenery maloca, near the River Curytahan, and send down his canoe with three Pammarys: my servant also, an Italian, who had come with me from Pará, refused to go further, and left me.\* On November 16th we started up-stream, they down: we have neither seen nor heard of them since. On our return the friendly Hypurinás, below the River Pauynim, showed us a plank of the canoe that they had picked up floating past. As if the canoe had upset, some of the Pammarys (who are almost amphibious) must have escaped, and it would have been no serious difficulty for even one of them to make a raft of fallen boughs, &c., and go down-stream, living on fruits, &c., I have little doubt that they were all killed by the Indians.† A subject of regret was

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\* One of Manoel Urbano's companions in 1861 turned back from nearly the same point, with two Pammarys only, and passed safely down—touching at no Indian village.

† By Hypurinás near the mouth of the river Aquirý, as I have since ascertained. —November, 1866.

the loss of my little collection of fossil-wood and bones, and other specimens.

We had now nearly a week's journey without malocas: some of the Manetenerys, however, including the old man, kept on with us. Little by little the Purús showed signs of diminution in size; yet often when we had sworn a solemn oath that he was dead, he got up again and sorely surprised us all. Though the river was on the whole rising, the diminution was more in depth than in width; for this was rarely as small as 100 yards, and often 200 to 300 yards. Below, when the river once fairly begins rising—there are often two or three false rises—it does not stop whatever be the weather: here, however, the flood soon followed the rain, and soon the fall began: in three floods, after a night's heavy rain, I found the temperature of the water exactly the same, 77.7 Fahr.

On November 21st we reached the little River Rixaká, Manoel Urbano's farthest point, and beyond entered wholly unexplored waters. Just below this is a very high *barreira*, 200 feet at least, commanding a clear view over the woodland from south to west. From the top of this we all fancied that we saw mountains—where they should be. Possibly we did; but there was too much cloud along the horizon to feel sure.

The next day we reached the first maloca of Canamary Indians. From the Manetenerys, who preceded us, they had already heard of our approach, and, crowned with feathers, came down to greet us and to buy of us. Among those who came, but uncrowned and apparently only to look on, was an albino, with sandy red hair, who seemed half idiot: they said he was a native. The Canamarys cannot be called a fine tribe, for they are not handsome: however, "handsome is that handsome does," and this praise they merit. Civilised essentially as much as the Manetenerys, though perhaps less enterprising, they are not, like them, ill-mannered, nor demoralised, nor thieves. Their clothes are the same, though not so well woven: nor are their canoes so well made, as the only iron they have is the worn-out stock sold them by the Manetenerys, for they do not themselves trade by way of the Juruá. Properly speaking, they do not belong to the Purús, but to the Curumahá, a large tributary a little above, on which is the force of the nation. Their language is different from that of the Manetenerys, and decidedly guttural: it has also a good many subtle sounds, *e. g.* like the French "eu." The two tribes, however, understand each other sufficiently. While among Canamarys we lost not one single thing, though being naturally curious, they take up and examine everything they see; but they invariably return each thing to its place or its owner, unlike the Manetenerys, who never, till compelled, do so, being in hopes of slipping something under their long garments in some lucky moment. Naturally in all bargains we screwed the

Manetenerys down to the lowest price, and paid the Canamarys liberally. I could not learn whether these Canamarys have any relationship by origin with the Canamarys of the River Hyuacú; as the latter are hostile to the Manetenerys, and do not wear clothes, it may be doubted. These had heard of, but not heard, firearms; so at their request, which they did not repeat, we fired a salute.

The chief of this first maloca said he would accompany us, and caught us up while we were at dinner on a sandbank: he waited for us to finish before he came up, and then asked for the remains of our meal, which he gave to the women of his canoe. From him we learnt that they call the Purús "Pacayá," and he marked with a stick on the sand the Purús, with the Curumahá entering on the left. He also told us that by an igarapé on the right side, a little below the Curumahá, one could pass, partly overland, to the River "Caspaha," a river of some size, which we suppose to be the Aracá, or a branch of it: on this he said there were many Manetenerys (or, as he termed them, Manichenerys). On Nov. 24th we reached the Curumahá, a very large affluent, but sufficiently inferior, especially in depth, to leave no doubt as to which was the main river, even apart from the information of the Indians. It must come from some distance, as the chief told us there were eight Canamary villages on it, the first of them three days up (and though sometimes there are two or three close together, yet in as many as eight there would be some intervals); above them another tribe, the Cujigenerys, who also use clothes and are not hostile; beyond them, but as we understood inland to the west, the Espinós, naked and savage. On paper every probability would seem to point to this as the river by which the Manetenerys pass to the Ucayali: they told us, however, that the way was still up the Purús. This I should readily set down as a lie, but for the total ignorance of the Canamarys respecting the Ucayali, which could hardly be were the Curumahá the route: they may, however, know the Ucayali by some other name.

At the mouth of the Curumahá, on the Purús, is a Canamary village. The chief was a merry fellow: he came wading into the water alongside of our canoes, and looked at and into everything. Nothing surprised him so much as the rudder of my canoe, which he worked from side to side for several minutes, uttering numerous exclamations of surprise. When I gave him a large fishing-hook in return for some bananas, he jumped almost out of the water with pleasure, and the gift of a new axe, in change for the wretched one they had—a mere stump—caused a universal joy in the maloca: even an old woman, who was crushing corn, left off, as if the day of such good fortune were a holiday. The first Canamary chief and some Manetenerys still accompanied us up-river: the former, however, did not seem to know much about this part. One of the

latter, with a stick, marked the river with five affluents—Yapahá, Curinahá, Ahapibá, Ipietahá, Cupenhipihapahá. Unfortunately the first of these, the Yapahá, hardly more than an igarapé, the only one we passed in their company, proved to be on the right instead of on the left, as they had marked it. This is about the upper limit of our old friend the uirana, which had been, since the Curumahá, diminishing in abundance, and size, and vigour. From the Curumahá up the current is very strong, which is not to be wondered at, as the difference of height in 144 miles is 340 feet = 2.36 per mile. On November 30th we reached a large maloca, as well as we could make out, of Indians, different from those we had yet seen, though alike in dress, &c. They call themselves Catianás; but this seems to be merely a corruption of “Ca-tillano.” They are certainly not Canamarys, and evidently do not think it a compliment to be considered such; nor do they seem to be Manetenerys, though as ill-bred and importunate, and given to thieving, as their height is decidedly less and their features differ. They use crowns of feathers, but very different from those of the Canamarys: the Manetenerys use none at all. The Canamary chief told us they were not natives of the Purús, but had come from a river to the west. He took leave of us here. The Manetenerys said they should stay here the rest of the day and catch us up on the next; but this was merely to deceive us, as we saw no more of them till our return here. We stayed a few hours, buying, as usual, some cloth and balls of cotton, as well as bananas, green corn, and papaws, of which two latter they had a good stock. Like all the Indians so far, they had a few fowls, but would not sell any. These Indians had strings of india-rubber, to serve as torches at night; so the tree is certainly found thus far, but probably not in abundance, as we did not see any in the wood.

From this point upwards, for many days, we saw no trace of Indians. The wood grew thicker and thicker with thorny bamboo, till almost impenetrable. This perhaps may account for their absence near the river-bank. The abundance and tameness of game, so scarce below, is a sufficient proof that Indians seldom come here. We passed several small rivers, which I left nameless, as misapplying the names, given us by the Indians, could only lead to subsequent confusion. To a larger one, about half the size of the Purús, I gave the name of Manoel Urbano (for want of a better), and to another smaller one that of River de Patos, as we happened to shoot a couple of black ducks just inside the mouth. A few miles above this the river divides (in lat. 10° 45' S.) into two forks, nearly equal, and neither of which *seems* even half the size of the river below the junction. Up to this point the Purús is still a good-sized river, at least in width, but in parts so shallow that we often had work to find a channel; and this was in December.

We had, however, no constant rain. From about lat.  $9^{\circ} 45'$  till the farthest south we reached—nearly  $11^{\circ}$ —we had an almost continual and generally strong north-west wind, with bright weather, barring a few light showers and some heavy storms, which latter always came from S.E. or E.S.E., bringing up the wind with them: these caused short furious floods, lasting, as already mentioned, but a short time. A few miles below this and on both forks above (but chiefly on the right fork) we found occasionally bananas, generally “São Thomé,” growing *apparently* wild on the river-bank. How a plant, that does not reproduce itself by seed, should thus spring up, is difficult to understand; but it is not less so to suppose that Indians had planted them thus—one here, another there—rarely two plants and never more together, and often with a mile or two, or even several miles, from plant to plant. On the right fork we did, indeed, once find that Indians had come by land and carried away the bunch of fruit (and this was the only trace of Indians we saw on that fork); but it seems more probable that this was a mere chance visit, as in many places we found the fruit rotting or fallen.

From December 11th to 23rd we travelled up the right or south fork of the river. This had at first a width of 80 or 90 yards, and, while low, no great current; but we were much delayed by long shallows over sand and occasional ledges of rock. The rock is of two kinds—a greyish-brown sandstone, which served excellently as a whetstone, and a sort of false conglomerate, like that already mentioned, which probably contains fossil-wood and bones: one large bone, apparently a thigh-bone, in perfect preservation, I found embedded. Unfortunately the rock was hard as that of the port of Ellangowan (of which a workman at night could carry away in his bonnet all that he had broke in the day), and after working five hours, most of the time in a heavy rain, I was driven off by the rise of the river. This flood may serve as an example of the rapidity of the floods here. The rain began at 8:30 A.M. with us and travelled up-river; at 2 P.M. the river began to rise, and in half an hour was rising at the rate of 3 feet per hour, as I found by marks: towards evening the current was so strong that we could not stem it, and stopped. At daylight the water was just on the turn; at noon it had fallen 9 to 10 feet, and in the later afternoon the whole rise, of 12 feet at least, had passed, and we were again dragging the canoe over shallows. The sandstone I found but once overlying the conglomerate.

Tapirs are extremely numerous on this river: they seemed rather astonished than alarmed at the sight of us, and, unless we made straight for them, seldom ran off. One or two standing in the shade of the “frecheira” in the heat of the day would not stir for our shouting to them: often when hearing them in the

wood some of my Indians would imitate their shrill cry, to which the tapir would answer, and so with calls and counter-calls come down to the water's edge. It served to beguile the weariness of the way; but we shot only what we needed. Capivaras are still more numerous and tame; and monkeys, even the light-leaping "coaitá," seemed hardly to fear us. On the fourth day, not at all to our surprise, we came to a rapid, and from this on had a succession of them, with calm water between. On both forks of the Purús (and to some distance below), more or less in all parts, but especially on rocky ground beside rapids, grows the *Calliandra trinervia*, that from its abundance is as characteristic here as the uirana below. Its peculiarity consists in throwing out its branches horizontally, like a cedar of Lebanon.\* In rapids these are a great hindrance, and sometimes we had to cut them away when the stream in the middle was too strong and deep for the men to wade there. In all we passed fourteen rapids (caxociras), not including strong currents (baixios), sometimes very troublesome from the smoothness of the rock at the bottom (a bed of the sandstone), which gave no hold to punt-poles. The rapids are not dangerous, but cause much delay, partly from the difficulty of carrying the cargo overland, owing to the height of the ground on each side. From the largest rapid, in about  $10^{\circ} 57' S.$ — $10^{\circ} 53'$  was the farthest south observed—the river makes northing again. Though this fork receives no affluent, except igarapés, yet these are so numerous, that in 60 miles from the mouth it had diminished to one-third of its first size; then it divides into two small streams, nearly equal. We ascended the larger, 15 to 18 yards wide, for a few miles, passing in one place beneath the trunk of a fallen tree, and this not a monster, but one 2 feet thick or so, that spanned it from bank to bank. Had this been the river, and not merely one fork of it, I should have pushed on till the last; but wishing to explore the other also, and seeing that we could not hope (owing to shallows, and in flood travelling is impossible) to make more than 3 or 4 miles a day by water, which would not be 2 as the crow flies, I thought it a waste of time to go farther. We tried to cut our way through the wood to reach, at least, some height from which to take a last fair look south-west; but owing to the thickness of the bamboos, the thorns of which are a great obstacle to men unshod, we had to return without success.

Thus far my little party had been singularly fortunate as regards

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\* The trees which obstruct the navigation of the Huallaga and Pastara by throwing out wide their horizontal branches are *Mimosa*, of the genera *Inga* and *Calliandra*. On the cataracts of the Huallaga it is chiefly the beautiful *Calliandra trinervia*, Benth.—the *Sidosasa*, or Silk-flower, of the Peruvians, so called from the bundles of long crimson stamens hanging out of the flowers like skeins of silk. [R. S.]

health; but now, man after man dropped with ague, and worse still, my guide with a very bad fever, so that on reaching the mouth of this branch on Christmas night I found not half my men fit for work, and had no option but to stop here some days. I made the most of my time by obtaining good latitude observations north and south, and observing the barometer A.M. and P.M. As it was the time of new moon, lunar distances were impossible. Guaraná, about a teaspoonful of the grated powder in a cup of hot water, proved an excellent remedy for the severe headache accompanying ague, and generally removed it in ten minutes (in fact, in all cases I have given guaraná for headache it has been effectual). With this and quinine some of the men improved, so that on December 30th I ordered a start up the left or north fork.

On the whole, this seemed to me the larger branch of the two; certainly wider for the first 20 or 25 miles (but as a rule shallower). Moreover, it has an affluent that may be called a river, which the other has not, and to the farthest point I reached has more or less of varzea. Turtles exist, though probably not in abundance, within this river, as on the second day we shot one (with arrow); tracajás both on this and the other fork. Inland of a small sand-bank we found some very small huts, made of sticks, &c., broken or cut with *stone*, no doubt by Indians who had come here when the tracajás were laying. Nothing noticeable remained but a stone that had been used as a whet-stone, and a large piece of petrified wood, that rang well when struck, balanced across another stone. On the third day we were again among rapids; and on the fourth day I found it impossible to keep on with two canoes, as wading had brought back the ague, and the sight of the sick men made the few that were well fainthearted and mutinous. As a last effort, accordingly, I left my canoe and the invalids with orders to go down to the mouth of this branch, and wait for me there, and started up in the ubá with no more load than mandioca-flour for 8 or 10 days, and my arms and instruments, and as crew two Bolivians and two Pammarys; one of the latter, however, was agueish, and the other generally out of health, and little better than skin and bone. The next day we saw on the left bank some bananas, evidently planted, on ground high above the river. Two of my men went on shore to get some, and after a good while came back saying they had found and followed a path which led them to an Indian hut, inhabited, as a monkey was tied up there. I then went, and found a very large plantation of bananas and corn, and beyond the hut with two or three young girls and some younger children. I spoke from a distance, and they allowed me to come pretty close, but then retreated screaming. Just then, however, a woman came in from the plantation, and though scared not a little at first, gradually took heart to come near, and began to talk with

great quickness, as well as I could make out from her mien, telling us there were men close by, as if to frighten us off. It is scarcely necessary to remark that Indians ignorant of firearms look upon any one without a bow as unarmed; probably the children had seen the Pammary who first went up *with* his bow, and therefore hid them-elves from him but not from me. I gave the woman some fishing-hooks, the only thing I had with me to give, and signified that if she would come down to the river with some of the parched corn-flour (much like the "*farinha de milho*" of Central Brazil), of which I saw a great jar, I would give her more things. Then I went off to the canoe; but as, after waiting an hour, we saw no one appear, we started again on our journey. On our return, in a few days, we found some of the people had been waiting for us at the port, by the ashes of a fire made since we had passed. I went up again with one of my men. We found the same woman, alone; this time she showed no fear, but began by giving me a good scolding for having made them go down to the river for nothing. This done, she gave us a sort of low bench to sit down on, and brought us bowls of corn-flour porridge, and then ran off to call her husband. Meanwhile, I examined the place. This and two other houses, evidently lately but not now inhabited, were sheds of about 15 ft. by 10 ft., with sloping roofs to about 5 feet from the ground, but open at the ends. Besides the corn-flour, I saw a good stock of corn in store, a stone axe, some arrows, several jars and pipkins, but no calabashes, and some cotton drying in the sun; the coat and a tame motun, but no fowls; dogs, of course. In a few minutes the woman returned, and in a few more her husband came running in, with bow and arrows in his left hand. When about twenty-five yards off from us, he took two arrows in his right hand—not an agreeable movement to watch—and coming straight up to me, gave me them, and then two to my man. The arrows were "*taquaras*," quite new, and painted (on the broad point) in pattern, and ornamented with coloured thread round the shaft—like the handle of a cricket-bat. The Indian was unpainted, and stark naked, but for his head-gear, which may be conceived as a fig-drum without top or bottom, adorned with three rows of fringe in front, of the fibre of some bark dyed red, and much longer hangings at the side of the face, not unlike the head-dress of Jewish high-priests—in pictures. The woman had a bit of coarse badly-made cotton stuff, as a "*tanga*," and many strings of black seeds round her waist, but not round her neck. She was partly blackened, much as if with *genipapa*-fruit (but I did not see the tree here); the man was unpainted. A boy, however, was painted from head to foot, before and behind, in a diamond pattern of red lines. The man seemed very pleased at seeing us, probably not from what I had given on my first visit (which was



of no value), but from our having then found the place defenceless and touched nothing: it was a novelty that any one should come not to harm. He did not seem to have the least idea of trading. I asked him for his head-dress, and he gave it me at once, and asked for my cap, but on my explaining that I could not spare it, seemed content. We talked for some time—not to much purpose; though guessing the general drift of what they said. I understood but one word, that of “fire,” which was the same as in Canamary and Manetenery; and I could not make them understand what I wanted to know. The name of their tribe I tried in vain to learn; nor did they seem to recognise the names Manetenery, Canamary, and Catianá at all. All inquiries as to the course of the river and the neighbourhood of any other river were equally fruitless. They are clearly Indians of the wood, and on the river-bank merely by accident. The path to the port was so little trodden that I doubt if they go there except for water when their small stream dries. From a point of high ground in their plantation (150 ft. or so above the river) I had a clear view all round, except from s.s.w. to w.s.w., where I most desired it; but on both occasions the clouds were very low, and stopped all distant view. As far as I could see there was nothing but undulating woodland. The whole family—there seemed to be but one here now—accompanied me down to the river, a third of a mile off; the man showed a little distrust, and would not walk in front; I had therefore to trust to his good faith (more than is prudent, as a rule), and let him go behind both of us. I gave them a number of fishing-hooks and arrow-heads, all, in fact, I had, a knife, and my American axe. Half of these things would have filled a Canamary maloca with delight, for the Canamarys have had just a taste of them, and covet steel implements above all things; but this Indian, being utterly unacquainted with iron, was not aware that he had gained when I gave him my axe for his, and showed merely pleasure, as at an act of friendliness—much about the same as when I gave him a bit of tapir-meat. By signs he asked us the use of the fishing-hooks, and, on seeing our line, how the hook was fastened on and baited. I have spoken of these Indians at some length, as from their industry, simplicity, friendliness, good manners, and utter ignorance of the existence of a world other than their own little world, they interested me much. I left them with regret at not having more to give them, but with the satisfaction of confidence that they will neither attack nor fly from the next traveller who comes among them. From the fact that these Indians were entirely unacquainted with iron, and much astonished at the sight of my canoe, I feel pretty sure that it is not by this river that the Manetenerys pass to the Ucayali; and if the Curumaliá be not the river, can only conjecture that it may be one of the small

affluents on the left of the Purús, about half-way between the Catianá maloca and where the Purús divides, which may approach some affluent of the Ucayali.

Half a mile above these Indians is an affluent, about 25 yards wide, which I have marked as River Mai-i-nauas, as that may possibly be the name of this tribe. On my return to the Catianá maloca below, I showed the head-dress and arrows to the Indians there; they did not seem to recognise them, but after a while said "Mai-i-nauas,"—rather, however, as I thought, asking me than themselves affirming. I do not, therefore, feel sure of the name.

Of my journey above, there is but little left to tell. The same night we had a furious storm of thunder and rain, the latter lasting 9 hours. Travelling was impossible the next day (Jan. 4th) owing to the violent flood. On the 5th I travelled, and at night reached a large rapid. Owing to showers during the day the river rose again a few feet. At daylight the rapid was very strong, and twice carried us down: by luck, we escaped an upset. In the afternoon we tried again, but ineffectually—thus wasting the 6th. On the 7th we passed, but the canoe nearly filled, and everything but my chronometer and cartridges got drenched. We travelled on till 4 P.M., when I reached a small fall, the limit of my journey. There was no way of passing it by water, as this being deep below we could not lift the bow of the canoe; and the ground on each side being high, it was impossible, with my 4 men, only 2 of them fit for anything, to drag the canoe overland. To pass rapids a double crew is essential. Had both canoes been here we might have passed. Reluctantly, therefore, I turned back, having ascended this fork one-third less than the other. The river here had an average width of 40 yards (at the outside), not varying much in ordinary parts. In narrows between high ground I have had hold of calliandra-boughs from both banks at the same moment; while sometimes immediately below these the river widened to 100 or even 120 yards. These, however, were pools scoured by the eddy from the narrow, widest at the top, and in 200 yards or so closing in to the usual width.

On Jan. 9th we rejoined the rest of our party at the mouth of this branch, and on the 10th started down, and on Feb. 3rd, having, below the river Aquiry, travelled day and night (*i. e.* floated at night), reached the mouth of the Mucum without accident. During the journey down I took frequent but not continuous soundings, except over shallows that I knew of. The current was now very strong, 3 to 4 miles per hour in the channel on an average.

It remains only to make some general observations on the geography of the Upper Purús. From the small size of both branches, at the farthest points I reached, and their rapid diminution, it is pretty clear that they cannot come from any *very great* distance;

in my opinion little, if at all, to s. of  $11^{\circ}$  lat.: certainly not from the Cordillera. No one who has seen rivers issuing from or near the Andes could imagine this. It may be added, in confirmation, that if they did, they could hardly fail to bring down some pebbles of granite or other igneous rock, or clay-slate. I searched for such, however, diligently, but found no stones but the water-worn fragments of the rocks "in situ." If, therefore, the river I followed be, as it has hitherto been considered, the true Purús, then the Madre de Dios is certainly not the source of the Purús. Three large rivers enter the Upper Purús on the right, the Aquiry, Hyuacú, and Aracá. One of these may *possibly* be the main river. Manoel Urbano travelled 10 days up the Aracá, 6 up the Hyuacú, and 20 up the Aquiry, and was in each case stopped by want of water. He reports all three rivers as inferior in size to the Purús; the first two decidedly so, the Aquiry but slightly, and with a stronger current. The mouths of rivers are a very vague indication of their true size; and from the tortuousness of the Purús, and its change of direction below undoubted affluents (*e. g.* the Paraná-pixuna, Tapauá, Pauynim, and even the little Tarauacá), the course affords no test. The Aracá I forgot (through haste to obtain an astronomical observation) to sound in. It is narrower than the Purús, and does not sensibly increase the width of the latter, but increases the depth by nearly one half. The Hyuacú is narrower, but somewhat deeper than the Purús. It scarcely alters the depth below, but increases the width considerably. The Aquiry increases the Purús considerably, both in size and depth; it is about the same width as the Purús at the point of junction, but somewhat shallower. When I passed on my return it was issuing with a far stronger stream and larger body of water than the Purús, its water much cleaner and cooler, occupying about two-thirds of the channel below. In modification of this it must be mentioned that the Aquiry seemed to be in full flood; whereas the Upper Purús had at least 4 ft. to rise up to the last year's high-water mark; and the river below the junction 18 inches. In the last 3 or 4 miles above the Aquiry the width of the Purús diminishes, and its depth increases. Its current *now* decreased; but this probably was from being held up by the Aquiry. These observations are, I am aware, tediously minute; but as their whole value depends on their minuteness, their tediousness will, I trust, be excused. A simple expression of opinion, with no reason assigned, would be valueless. On the whole I think it possible that the Aquiry may be the greater river, and its course (up-stream) can hardly fail to be towards the known part of the Madre de Dios; but I incline to think this river will eventually be found to be one of the many sources of the Beni.

Certainly, the simplest solution of the problem would be a

descent of the Madre de Dios from the Cordillera; but there are great difficulties in the way of this: first, the hostility of the Indians, the Chunchos, and secondly, the impossibility of obtaining a crew in Carabaya. It by no means follows that the Indians would be equally hostile to a party ascending the river. In Pasto (New Granada) I was told that the descent of the Japurá was very dangerous on account of the Indians; and an old Brazilian trader on that river tells me that the Miranhas, a tribe 20 days by river within the boundaries of New Granada, declared to him boldly that they always attack any one coming from above (as those from above in old times tried to subdue them, and never brought them anything); they are, however, most friendly towards, and honourable in their dealings with, traders from below. The second difficulty might be met by taking men from here, as, once embarked on the Madre de Dios, with their faces homewards, they would not turn back—up-stream—for any danger. This plan would, however, be very expensive, and natives of the Amazon would probably not stand the cold of the Cordillera.

*Latitudes and Longitudes of Points on River Purús.*

	Latitude s.	Longitude w. of Greenwich.	
		Time.	Space.
	° ' "	h. m. s.	° ' "
Sítio de Manoel Ascensão (Birury) ..	3 53 20	4 5 28 (A)	61 17 00
Sítio de Florencio .. .. .	4 17 16		
Arumá (old Mura mission and village)	4 45 15	4 8 35 (A)	62 08 45
Highest point (up river) of I. Uajaratuba	5 4 0		
Sítio de Boa Vista .. .. .	5 15 50	4 11 36	62 54 00
River Paraná-pixuna (mouth) .. ..	5 37 0	4 12 30	63 07 20
Barreira de Ipocurili (highest point) ..	5 43 0		
Feitoria de João Gabriel .. .. .	5 36 10	4 15 24	63 51 00
River Tapauí . . . . .	5 46 20	4 17 22 (A)	64 20 20
Barreira de Cauarihá (Igarapé mouth) ..	6 8 0	4 16 42	64 10 30
River Mucum .. .. .	6 32 15	about 10 sec. E. of next.	
Canotama (feitoria of Manoel Urbano) ..	6 32 20	4 17 22 (A)	64 20 30
River Marý .. .. .	7 4 12	4 18 7	64 31 45
River Ituxý .. .. .	7 18 43	4 19 9	64 47 15
River Sepatynim .. .. .	7 35 6	4 21 25	65 21 15
River Panynim .. .. .	7 47 35	4 28 12 (u)	67 03 00
Igarapé Anaury (mouth)* .. .. .	8 19 24	4 29 8	67 17 00

\* By an observation of  $\epsilon^2$  Sagittarii Oc. D (Sept. 1st, 1865) the longitude of the Anaury mouth is  $4^h 29^m 20^s$ , and the longitudes of the neighbouring positions deduced from this by chronometer are—

	h. m. s.
River Panynim .. .. .	4 28 20
River Inaunym .. .. .	4 29 38
River Aquiry .. .. .	4 29 54

which differ little from those determined in 1864, as given above

*Latitudes and Longitudes of Points on River Purús—continued.*

	Latitude s.	Longitude w. of Greenwich.					
		Time.			Space.		
		°	'	"	H.	M.	S.
River Inayunim .. .. .	8	30	34	4	29	25	67 21 15
River Aquiry .. .. .	8	45	6	4	29	26 (a)	67 21 30
Point of observation of eclipse of sun, Oct. 30th, 1864 .. .. .	9	1	2	0	37	56.6(4)	69 29 00
River Aracá [N.B. lat. by dead reckoning from 6 miles below] .. .. .	9	8	10	0	39	26 (a)	69 51 30
River Curyahá .. .. .	9	25	15	0	42	7	70 31 45
River Rixalá .. .. .	9	47	10	0	43	0 (a)	70 45 00
River Curumahá [lat. by dead reckoning from 7 miles below and 6 miles above] .. .. .	9	57	0	0	43	55 (a)	70 58 45
River de Manoel Urbano .. .. .	10	34	47	0	45	48	71 27 00
Purús divides .. .. .	10	44	55	0	47	22 (a)	71 50 30
Farthest point of observation on N. fork	10	36	44	0	48	36	72 09 00
Farthest point of observation on S. fork	10	52	52	0	49	8	72 17 00

*Distances from Mouth of River Purús.*

	English Miles.	Height above Sea-level.
San Thomé Channel .. .. .	10	
Birurý Channel .. .. .	15	
Cuianá Channel .. .. .	65	
Barreira do Sacado .. .. .	142	
A Campina (Mura maloca) .. .. .	201	
Boa Vista (last house up river) .. .. .	249	
River Paraná-pixuna .. .. .	306	
River Jacaré .. .. .	360	
Barreira de Umaham .. .. .	470	
River Tapauá .. .. .	505	
River Mucumim .. .. .	590	107 feet.
River Marý .. .. .	653	
River Ituxý .. .. .	692	
River Mamoria-mirim .. .. .	745	
River Sepatynim .. .. .	762	
Barreira de Hyutanaham .. .. .	812	
River Mamoria-grande .. .. .	890	
River Paunyim .. .. .	978	303 feet.
River Inayunim .. .. .	1073	
River Aquiry .. .. .	1104	364 feet.
River Canguity .. .. .	1170	
River Hyuacú .. .. .	1241	457 feet.
River Aracá .. .. .	1445	587 feet.
River Tarauacá .. .. .	1494	
River Curyahá .. .. .	1560	663 feet.
River Rixalá .. .. .	1618	716 feet.
River Curumahá .. .. .	1648	748 feet.
River de Manoel Urbano .. .. .	1745	
River de Patos .. .. .	1785	
Purús divides .. .. .	1792	1088 feet.
Farthest point reached on S. fork .. .. .	1866	
Farthest point reached on N. fork .. .. .	1847	

At Canotama (River Mucum) mean of 16 days' observation—\*

		INCHES.			
Bar. (at 32°)	9 A.M.	29.930	E. 74.7°	D.—W. (9 A.M.)	3.46
„	3 P.M.	29.812	E. 79.3°	„ (3 P.M.)	5.56
Mean	..	29.871	E. 77.0°	Mean	.. 4.48

Barometrical observations at other points were referred to Canotama, if a single observation to the homologous hour, so as to eliminate the diurnal variation. The height of Canotama was calculated with  $\text{bar.} = 29.98 \text{ z. } 82^{\circ}$  at sea-level (which may not be correct).

At point where the Puriûs divides, lat.  $10^{\circ}45'$  s., mean of 4 days' observation—

Bar. (at 32°)	9 A.M.	28.964	E. = 81.0°	D.—W.	5.5
"	3 P.M.	28.808	E. = 83.5°	"	6.0

The barometer used was a portable Fortin bar. (by Casella), with vernier reading to  $\frac{1}{500}$  inch; the zero had been determined at Kew. The "ring" continued sharp throughout.

## APPENDIX.

*Map.*—This has been made from bearings and distances taken throughout the whole river, and from observations with sextant and artificial horizon (mercurial). Observations of latitude were taken at 79 points, and time observations for longitude by chronometer at about three-fourths of them. So far as was possible, time observations were repeated at the principal points on the down voyage, so as to be dependent on chronometer for a few days only. The absolute longitudes marked (A) were determined by occultation, the circumstances of which (of all visible) were always calculated beforehand. These points are—

- \*4. Canotama, Aug. 19th, Jupiter, Oc. D., 4 h. 17 m. 19 s.  
 „ „ Jupiter, Oc. R., 4 h. 17 m. 23 s.  
 Aug 11th,  $\psi$  Ophiuci, Oc. D., 4 h. 17 m. 24.5 s.

\*3. Mouth of River Tapauá, Aug. 15th  $\beta$  Capricorni, Oc. D., observed a few miles below, on nearly the same meridian (differing 1 sec. by chronometer).

5. A point about 30 miles below River Aracá, by end of eclipse of 22, Oct. 30th. The beginning of the eclipse was also observed; and calculated (without second differences) as a general test, but not relied on as it differed about 20 sec.

The longitudes intermediate and above depend on chronometer. I am aware that the longitudes of the highest part of the Purús would make it cross the Ucayali in some maps; but being ignorant how the longitude of that river has been determined, I have not chosen (which indeed would be scarcely honest) to alter my results. Annexed are some of the ratings of the chronometer, to show what reliance may be placed on it—

\* At the same place, 1865: July 23—Aug. 5.

	INCHES		
9 A.M. Bar (at 32°)	29.898	E. = 76.0	(D.—W.) = 2.56
3 P.M.        „	29.779	„ = 82.1	„     = 5.62
Mean        „	29.838	E. = 79.0	„     = 4.09

Stationary at Canotama, July 27th to Aug. 12th, losing ..	4.25 sec. per day.*
Down from Canotama and back to same point, Aug. 13th to 27th, losing .. .. .	3.5 "
From Canotama to point of observation of eclipse of ☾, sup-posing the longitude correct, Sept. 5th to Oct. 30th, losing	3.6 "
From Oct. 30th to Dec. 11th I had no means of rating.	
Dec. 11th to 23rd up S. fork of Purús and back to mouth, losing .. .. .	5.3 "

The chronometer being several times carried overland, when canoe was unloaded for rapids.

Dec. 30th to Jan. 9th, up N. fork and back to mouth, losing 4.9 sec per day.

Canoe unloaded three or four times.

Jan. 19th to Feb. 3rd (point of eclipse of ☾ to Canotama) 4.16 "

This is the rate I have assumed for Jan. 9th to 19th, and on which depends the longitude of the point where the Purús divides. But supposing the true rate to differ from the assumed rate by as much as 2 sec. per day, and more does not seem probable; this in 10 days would give an error of 5 miles only. It may be added that the longitude of the farthest point of observation on N. fork, determined chronometrically, differs from that given by a set of lunar distances by 5 sec. only; this of course was a chance, but it serves as a general confirmation. The chronometer was never taken on shore for observations, except those of occultations (and the accompanying time observations); others being taken with a watch duly compared. Points determined on the *down* voyage, and therefore depending but a few days on chronometer, are marked (*a*).

The distances may seem exaggerated, but the tortuousness of the Purús explains them. The difference of latitude by dead reckoning about as often fell short of as exceeded that given by observations. The distance from the mouth to the Barcña de Hyutanaham, given by the steamer expedition, exceeds by 10 or 11 miles mine, which was calculated altogether independently, being made up of the miles and half miles of the different bearings.

The languages of tribes on the Purús seem to have but little resemblance to one another, as will appear from the following words:—

English	Pannamary.	Hypurina.	Mancenery.	Canaway.
Sun	safiný	atocantí	cashí	wari.
Moon	massicu	cassirí	siri.	
Fire	sijú	chaminá	chi-chi	chi-i.
Water	pahá	iborahai	húni	waka.
River	wainý	wéni	wéni.	
Dog	djuimayhi	anguity	kéwé.	
Tortoise	u-jurú	chetu-yu	canuyá.	
Tapir	damá	chamá	chema	chemá (German "ch").
Hen	aracauá	patarí	cataurí.	
Bananas	sepatihí	chi-parí	sapaná.	
Star	boirí	wirikí	cataherí.	
Father	bi-y	pate	} These words in both languages I did not verify with natives.	
Mother	miá	natú		
Brother	adjuú	nabirí		
Woman	gamú	setú		
Girl	manuany	seturuntim		

About half the Pannamarys understand the Lingoa-geral; not more than eight or ten Hypurinas.

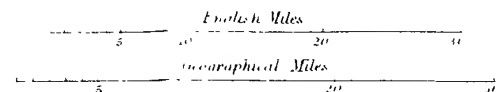
\* The rate given by the maker (C. Frodsham) in Nov. 1863, was "gaining 0.5 per day;" but the chronometer had been (of necessity) allowed to stop for two months, before my journey up the Purús, and on starting again assumed a losing rate of 4.5 to 5 per day.





# Map of the RIVER AQUIRY

(an Archaic of the Paris)



Depth is from soundings observations. The number in brackets indicates the depth of the river at the mouth of the river. The number in brackets indicates the depth of the river at the mouth of the river. The number in brackets indicates the depth of the river at the mouth of the river.

Where marked as 12 & 21 the first number is the actual sounding the second number the additional depth estimated by eye that the river would have when full.

Distances from mouth of R Aquiry

R Endimay	28 English Miles
R Irarup	138
R de Pontes	217
Irarup Verd	303
R de Frapas	393
Sacado	446
Last affluent reached	165

VII.—*Notes on the River Aquiri, the principal Affluent of the River Purús.* By W. CHANDLESS, ESQ., M.A., Gold Medallist, R.G.S.

Read Feb. 25, 1877.

THE Aquiri enters the Purús on the right, in lat.  $8^{\circ} 15' S.$ , long.  $67^{\circ} 23' W.$  In writing of the Purús in 1865, I spoke of the Aquiri as bringing down a body of water equal to that of the main river, and as being possibly equal, or even superior, to that in size and importance: in this, however, I was entirely deceived: it is merely a tributary, though a large one—inferior both in length and width. It is somewhat less tortuous, but, being narrower, its reaches also are shorter, and the turns more abrupt. From the mouth to about  $11^{\circ} S.$  sand-banks (praias) are scarce, far apart and small: at low water, however, many flats of hard clay at the edge of the "*terra firme*" are left dry, and in parts also banks or ridges of this in the middle of the river, with occasional reefs of rock. In some of these places I found fossil bones—two vertebrae in perfect preservation—which Professor Agassiz while in Manaus was kind enough to examine, and pronounced to be of the *Mesosaurus*; there was also a turtle of an extinct species, and some smaller fragments. Petrified wood is not common, as on the Purús, but some pieces half-carbonised now and then appeared; in parts an ashy efflorescent salt is rather abundant, whether saltpetre or not I cannot say.

The Hypurinás, Indians of the Purús, extend up the Aquiri eight or ten days' journey. From some of these, in about lat.  $9^{\circ} 40' S.$ , we learnt that they travel (to buy implements of stone) in three and a half days E.S.E. to another river, smaller than the Aquiri, they said, which we supposed to be the River Ituxy (affluent of the Purús below); they did not give this name, but spoke of the point they go to as Puriquity: and it is known from Hypurinás of the Ituxy, that there is a point so called a good way up that river. It is to be remarked that the Aquiri from its mouth to  $11^{\circ} S.$  has not a single affluent on the right, beyond mere little streams—not even a good-sized *igapapé*—showing that the ground from very near that bank must slope to the east towards some other river.

Above the Hypurinás, from about  $9^{\circ} 15'$  to  $10^{\circ} 15' S.$ , are the Capechenes, a tribe of which we saw nothing at all, as they live a good way inland. They seem not to use canoes but rafts (now and then of wood, but generally of "*flecheros*") which probably serve merely as ferry-boats, and not for navigation up or down river; in one snag-choked narrow they had made a temporary bridge from snag to snag: perhaps during some migration. Manoel Urbano in his journey (at an earlier time of year than

mine) saw a good many of these Indians then on the river-bank after *tracajís* eggs; he describes them as tall, handsome, and clear-complexioned; apparently warlike, and somewhat disposed to hostilities. Probably they are to be found also on the River Iririapé, an unexplored affluent of the Aquiry, and little inferior to this in size and depth at the mouth, but on both occasions when I passed with scarcely any perceptible current or outset; its water is extremely white, almost milky. It approaches the Hyuacú nearly; and Canamary Indians, from that river, are found on the upper part of it, as we learnt from the Hypurinás already spoken of.

On the banks of the Aquiry, near the water's edge, always below flood-mark, wild tobacco is extremely abundant, especially from about  $9^{\circ} 30'$  to  $10^{\circ} 30'$  s., where its flowers whitened the bank-side; in less amount, it is found also on the Purús. Among trees not found below is the palm, the leaves of which are used for making hats in Bolivia; whether it be the "Bombonassa" used in Moyobamba or not, I am ignorant. Some of my Bolivian crew being hat-makers, dried and brought down many bundles of leaves. A species of "embira," also known in Bolivia, where the bark is used for making ropes, was common and very noticeable from its dark red stem, small head, and manner of bursting into leaf, like the horse-chestnut. About  $10^{\circ} 50'$  s. the thin-leaved uirana of the Amazon, not found on the Aquiry or Purús below, begins to show itself, and gradually becomes as common as the broad-leaved species ordinarily found; but it never supersedes the latter, and towards the sources of the river disappears first. Game—including in this term all land animals ordinarily eaten—is abundant in nearly all parts of the Aquiry; fish is scarce, or at any rate difficult to catch.

Up to  $11^{\circ}$  s., a distance by river of about 300 miles, we travelled without the least difficulty (Sept. 5th to 30th). Above the River de Pontes,\* Manoel Urbano's farthest point, the river narrows, but this is rather owing to the nature of the ground, and the rapidity of the descent, than from much actual diminution in size. But after fairly crossing the parallel of  $11^{\circ}$ , the river definitely changes its (up-stream) course, re-crossing to the north, and then keeping nearly due west for more than a degree. At the same time it changes its character, instead of narrowing it widens out, and becomes as abundant in sand-banks (praías) as below it was scant of them. As a natural consequence the water shoals very much, and the river from this up becomes very difficult of navigation. The want of water is but one of the difficulties;

\* In lack of the true, that is, the native names, I have given names to a few rivers for convenience of reference, and to avoid periphrases, having no wish that they should be permanent, I have not been particular in the choice of them.

the labyrinths of snags, and stranded or entangled timber, often occupying the whole river-bed for many hundred yards, are almost worse. Shallows with sharp currents and rock are very numerous, but there is nothing that can properly be called a rapid till above long. 70°, where the river is quite small. In general the rock is nothing more than the hardened clay of the *terra firme*, but here and there sandstone occurs, and also the pseudo-conglomerate, as I called it, of the Upper Purús. I believe the latter to be the deposit yielding the fossil-bones (all found loose): the turtle, at any rate, had a mass of this within the concavity of the shell. Loose stones in the currents are mainly of it.

On this part of the river, on the parallel of 11°, we found two distinct tribes of Indians, both apparently small. The first was very timid. One day we met some ten Indians, including two or three women, coming down-stream in a couple of "ubás;" at sight of us they made for shore, and went off into the wood, leaving all they had except bows and arrows; in vain we called to them and showed knives, beads, &c., either they did not hear or they distrusted us. The same happened a second time with a single ubá, but this time the Indians went off and alarmed a neighbouring "maloca," so that, on our arrival there, we found there had been a general exodus. As usual we left trifling presents, which they found on their return. This bred confidence, or their desires overcame their fears, and they followed us by land, and three days afterwards came out on the river-bank calling to us. They are a fine, tall, clean race of Indians, but not good-looking; the women, however, we never saw, except at a distance in the first ubás. Their houses seem in general to be not very far inland, one to two miles on an average; they are neatly made, but for the most part mere sheds, not closed in at the sides, excepting a store-house of treasures and ornaments used in festivals, some rather curious. In the plantations I saw bananas, maize, aipim (or "yuca"), but not mandioca, also coca, papaws, sugar-cane, and cotton.\* The women wear a piece of cotton-cloth round their waist, reaching half way down the thigh; at least a little girl seven or eight years old, the only child I saw, was so clad. The men go entirely naked. Despite their timidity they talk very loud, indeed with much vociferation; their pronunciation is indistinct, and somewhat guttural. Words signifying parts of the body all (that I learnt) begin with "n," the vowel, however, following this seems to vary; there was a termination "râ" that I could not understand; thus on asking the word for "river" the answer was "washiri," "washiri-râ," and so in several words which they re-

\* These Indians, like most, colour their faces with urucu, but I did not happen to see the plant.

peated a second time with this affix. They had some few articles of iron, all made of broken pieces, evidently bought from some tribe better supplied, probably that *above*, as indeed we understood from them; one piece had the maker's name on it, and another the trade mark, both such as are imported by way of Pará. These Indians were all well behaved, and did not attempt to steal, or, indeed, to meddle with anything in our canoes. Their canoes are all ubás, made of paxiuba palm.

The district of this tribe apparently ends some way below the River de Pragas, a large affluent on the right, about two-thirds the size of the main river above the junction. I went a short way up it, but found it so blocked up with snags and fallen trees as to be unnavigable. Doubtless it rises in the same high-land to the south as the Aquiry, but at a somewhat less distance; as after rain and a consequent rise, the water had fallen a good deal in this branch, when only beginning to fall in the main one. A little below this on the left bank was high *terra firme*, about 250 feet above the level of the river, commanding an extensive view southward, not shut off by a lower ridge a few miles off running about east and west; unfortunately low rain-clouds hid the horizon. At the mouth of a small river, in long.  $69^{\circ} 12'$ , I went to the top of a similar, but lower *terra firme*, the east and west ridge, however, shut off the view; one of my men, who climbed a high tree, reported to S.S.W. far off blue hills, occupying but little space on the horizon, as if the end of a ridge.

Above the River de Pragas, *igarapés* and small affluents are more numerous, the great majority still as below entering on the left; consequently the river diminishes rapidly in size. Shallows and sharp currents are closer together; the rock most common in them, the hard clay, is traversed in all directions by small veins, whiter and harder, but not apparently otherwise differing from the general mass, above the surface of which they stand a quarter to half an inch; our feet were much bruised and cut by them. Fortunately after the middle of October the rain helped us. A north-west wind was as prevalent here as on the Upper Purús; on our ascent we did not meet it till fairly on the parallel of  $11^{\circ}$ , not at least as a constant wind, but on our return it accompanied us nearly down to  $10^{\circ} 30'$ . Here, however, the north-west wind brought the rain—sharp, driving rain, but scarcely what would be called heavy even in England. In the case of the heaviest we had, the rain-clouds came up from the south-east, but passed without raining, soon the north wind brought them back, and it rained six hours.

About long.  $70^{\circ}$  we again found signs of Indians, and soon came to a deserted maloca with a large plantation on the river-bank, with all the plants I have mentioned as seen in that of the Indians below. Some 10 miles above we reached a "port," and half-a-mile

inland the house, a large shed open all round, but with the roof reaching to about 4 feet from the ground. We found only two men there: they showed neither much surprise nor fear at sight of us; perhaps they knew of our approach, for on our return a few days later we found several families here. These two accompanied us up-stream along the bank, and in shallows assisted in dragging up the canoe. Tired of putting their bows and arrows down continually and going back for them, they left them once for all, and kept on with us entirely unarmed. They took us to another "maloca," 6 or 8 miles off, up a small affluent (River da Maloca) which our canoe could not enter; but the people of this were all absent: we wished to leave presents of beads, &c., but our guides immediately took possession of all. This tribe is distinct from the one below, not understanding the words of the latter (a score or so of which I had written down) and using different words. They differ also in features and are shorter. They had a large supply of iron, mostly, but not all, broken pieces, including fishing-hooks. This they obtain, as we understand, from the Manetenerýs\* of the Purús, who extend a long way up the River Aracá, by which these trade with them. They use a good many Manetenerý words, not merely for articles of trade but even names of plants—those of the plantain and papaw, *e. g.*, are the same—they knew of salt, and asked for it, and wished to buy it: those below would not even taste it. The "tuxaua," or chief, had a poncho and hood exactly of the Manetenerý fashion. Both these Indians and the tribe below have dogs, but no other domestic animal: at least I saw none. Their ubás are generally of paxiuba, but I saw one of cedar; the bow and stern of which were of Manetenerý form, but the work much rougher. We could not find out the name of either this tribe or the one below; the answer to our questions was invariably the name of the answerer.

Above the River da Maloca, the river, here very small, has rapids. A few miles above is another affluent, the last I reached, almost equal to the main river, and which—that is, the want of which—reduces this almost to an igarapé: at a fair average place I measured it and found the width 54 feet at high-water mark, 5 feet or so above the then level of the water, now 8 or 10 inches deep at that point. In parts the river widens out into pools; in

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\* It should have been mentioned, as a note to the former paper, that the Brazilian explorer Serafim speaks of the Manetenerýs by the name of Cucamas; but without giving any reason for believing them such, and in fact erroneously. Mr. R. Spruce, having kindly examined the few Manetenerý words I had obtained, writes to me, "Your vocabulary, though so scanty, is quite sufficient to prove that the Manetenerýs—far from having any relationship to the Cucamas, who are a Tupinic nation—are really a section of the great Caribe nation." The word Manetenerý is said to have been (like many Indian names) originally a nickname, applied to them by the Hypurmas in reference to their graced-dyed ponchos.

others it narrows much: in one place, but for want of running ground, I could have jumped it. The rapids here were very close together: in fact it seemed to me that the river was still descending from the ridge where it rises. The obstacle to our further progress, however, was not the frequency of the rapids, but the extreme shallowness of the water, and the men having their feet much cut by the rock I have mentioned before. But for my canoe being a very small and flat one I should not have got even thus far: the larger one I had left, with most of my men, nearly 100 miles below. The wood is an impenetrable bamboo-jungle, with few large trees near the bank, and neither *uirana* nor *araçá* grow here. Below the River da Maloca piums were in full force; but above the last affluent there were absolutely none.

On my return down river, from a point in about lat.  $11^{\circ} 2' \text{ s.}$ , long.  $67^{\circ} 54' \text{ w.}$ , I started inland, striking due south, hoping, as the limits of the basin of the Aquiry were evidently very near, to reach some other river. Perhaps, had the wood been fairly clear, we might have done so: unfortunately it was very thick, which, besides rendering our progress very slow, had the effect of making it almost impossible to shoot anything, as the noise of cutting our path scared away all game. We travelled inland six days (having first spent a day in beginning the path and returned to the canoes), but returned the whole distance from our last sleeping-place, beyond which I went about 2 miles, in one day—a hard one. At 4 or 5 miles from the river-bank we crossed high land, the boundary, as I believe, of the Aquiry, and beyond this came to a succession of small streams, all with a general direction of east, running in deep little gullies, with a bottom of black boggy earth, 40 or 50 yards wide, full of tree-ferns. The largest, to which several on each side evidently converged (and probably all eventually do), was about 6 feet wide and 2 feet deep: it had now not rained for five or six days. From this point, about 20 miles from the Aquiry, I changed my course to south-east. The ground to the south of this stream did not rise again at once, but kept on low, 6 or 8 feet above the water, after the fashion of "*Varzea*," to the next stream. Beyond this point I went some 6 or 7 miles, reaching perhaps lat.  $11^{\circ} 24' \text{ s.}$ ; of course the estimate is a rough one. In the whole distance, except within a mile or so of the Aquiry, we saw not a sign of Indians; not a foot-print; not a bough broken, nor a single chesnut—by man. In parts chesnut-trees are numerous, generally where the wood is clearest, many of them very fine large trees. India-rubber trees, also of good size and quality, are fairly common. True cocoa we saw but once; but what is called "*cacao da terra firme*" often. Among palms, the *paxiuba* and *pataua* were by far the most abundant, the latter loaded with ripe fruit: by a foolish economy, we had dispensed with the burden of a camp-

kettle, and could therefore make no use of it. Sarsaparilla we did not see. A bamboo (*Camai-úna*), used, I am told, by the Indians of the Madeira for their arrows, was recognised by my Bolivians.

The only conclusions I could draw from this journey were—1st, That the existence of open plain in these parts is very doubtful. 2nd, That probably there are large tracts uninhabited, and even unfrequented, by Indians. Groping as I was in the dark I did not care to make a second start. According to Mr. Markham's map of Carabaya, I could hardly have failed, by continuing my journey about as far again, to have struck the Madre-de-Dios. Unfortunately I did not receive that map till my return to Manaos.

Besides the Aquiri my hope was to have explored, at least to some extent, the Hyuacú, the next large affluent above: the time, however, spent on the former, and the loss previously to reaching it of a part of our provisions by the sinking of an auxiliary canoe, rendered this impossible. I regret it less, however, after completing the map of the Aquiri, and seeing it jointly with the Purús. It will be observed that from my farthest point on the former to the nearest point of the latter barely exceeds 60 geographical miles. The longitude of the point on the Aquiri cannot be very much in error, as I obtained absolute observations only 25 miles east; the longitudes of the Purús are less certain, but so far as mine contradict those of other maps (of the Ucayali) they do it by excess, not by defect; therefore it is probable that the distance shown—60 miles—will not be too small. I cannot suppose that a large river passes through this gap. As the Indians cross from the upper part of the Aquiri to the Aracá, it is likely that the Hyuacú, if it reaches so far, is but small.

There is no reason to suppose the Hyuacú, or Aracá, equal to the Aquiri, much less to the Purús; least of all, that either of them can be the River Madre-de-Dios.

*Geographical Positions.*—On the River Aquiri, observations of latitude were taken at more than twenty points (and of time at most of these); but, from unfavourable circumstances, were not obtained at most of the important points—river-mouths, &c.: in general, however, near enough to prevent any great error. Two occultations were observed nearly on the parallel of  $11^{\circ}$  S., at the points marked "A" on the map; at the upper of these points (the mouth of Eclipse River) the end of the eclipse of the sun of Oct. 19th, 1865, and an eclipse of Jupiter's 1st satellite, were also observed: the mean\* of which agreed very nearly with the result of the occultation. The following positions were determined:—

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\* It may seem strange to take the mean of observations usually of such different value; the eclipse of the sun, however, was scarcely more than a contact, and the



River de Praças .. ..	lat. s.	10° 56' 40"	long. w.	4 38 11 = 69 32 45
River de Eclipse .. ..	"	10 55 31	"	4 39 41 = 69 55 15
Sacado (neck of bend cut off) ..	"	11 1 18	"	4 40 32 = 70 8 0
Last affluent reached (on left) ..	"	11 4 0	"	4 41 23 = 70 20 45

*Geographical Position of Manáos on the Rio Grande.*—The following observations to determine the longitude of Manáos (Barra do R. Negro) may perhaps be worth recording:—

1864. May 12.—κ Caneri Oc. D., giving longitude	..	4 0 2·8
1865. " 29.—α " " "	..	4 0 13·8
" Dec. 21.—ν Aquarii " "	..	4 0 8·7

These were all disappearances at the *dark* limb of the moon, and observed, I think, with considerable accuracy.

The Brazilian determination of longitude is 3 h. 59 m. 49 s., and of lat. 3° 8' 4" s. This latitude is about correct, and the same as given in old maps. The latitude of Barra in Lieut. Herndon's map is very erroneous.

## APPENDIX.

[The following is an account of Manoel Urbano's ascent of the Mucum and Ituxy, tributaries of the Purús, translated from Dr. Coutinho's official Report to the Brazilian Government.\*]

Manoel Urbano da Encarnação was commissioned to examine the portage between the Purús and the Madeira, and in doing this to enter the largest affluent of the Purús, on the right bank, above the Mucum. This river, according to the reports of the Indians, reached as far as the first falls of the Madeira, and would much facilitate the transactions between the inhabitants of the two river-valleys in future times.

On the 13th of August, 1864, Manoel Urbano entered the Mucum, supposing apparently that it led to a point above some of the falls of the Madeira. After navigating four days he met with the Içnam, an affluent of the right bank; up to this point the Mucum has from 2 to 3 fathoms of water, mean height. Entering the Içnam he navigated it as far as a village of Catauxi Indians, by whom he was informed that if he continued that way he would come out below the falls of the Madeira. Hearing this he redescended to the Mucum, bringing with him two Catauxis, and continued his way up the river, a little beyond the mouth of the Içnam the first group of rapids were met with, five in number, which he passed in the course of one day.

A day and a half beyond the last rapid the affluent Aity enters the Mucum on the left bank: it comes from the campo- (grass-lands) of the Madeira: in this direction the banks of the Mucum are low. In another day he arrived at

relative motion of sun and moon extremely slow, from the objects being very near the meridian. The errors in each case were on the side they naturally would be; the end of the eclipse of the sun had been observed too soon; the *re-appearance* of Jupiter's satellite too late, as compared with the result given by the occultation.

\* Contained in the 'Relatorio apresentado á Assembléa Geral Legislativa na terceiro sessão da decima-segunda Legislatura,' 1865. Anexo P. p. 3. Translated by Mr. H. W. Bates, Assistant-Secretary R.G.S.

a lake called Agaam, from which there is a road to the river Marý, which enters the Purús above the mouth of the Mucum. From this point Manoel Urbano navigated three days and a half, arriving then at the villages of the Pammaná Indians, the river in this part of its course flowing through some small tracts of open grass-land.

Mistrusting the object of his visit the Pammanás showed at first a hostile disposition, but they were soon appeased, and accompanied the explorer when he continued his journey. The river was now from 60 to 80 yards wide and three feet deep on the average. After having travelled one day further Manoel Urbano began to hear the roar of waterfalls. The river gradually became narrower and hummed in between high banks, and it was necessary to remove the obstacles from its bed to enable the canoe to pass. Our explorer travelled in this way five days, necessarily including many delays, having to pass eight falls or rapids.

The canoe voyage then terminated and Manoel Urbano commenced his journey by land. After a march of three days and a half he arrived on the left bank of the Madeira, in the neighbourhood of the falls of Theotônio, which are the second in order of succession on this river.

Our explorer found himself now destitute of resources and with several of his Indian companions ill with intermittent fever. He set to work to make a canoe in which to descend the river and procure help and supplies.

On the 18th of September I myself passed the falls of Theotônio when on my return from Guajará, and *en route* for the falls of St. Antonio. Urbano caught sight of our party, and crossed the river to communicate with us. He no longer found me, however, at the landing-place when he arrived, and it being late he passed the night there, continuing the next day his route towards St. Antonio. I left this place very early in the morning, and therefore Manoel Urbano was not able to meet with me; the commandant of the frontier post, however, gave him some provisions and medicines. He returned to the Purús by the same route he had come.

From these data it may be seen that the Mucum is navigable at half-flood during eleven days in large canoes, and five days further in small canoes. It is probable that this distance may be accomplished in less time, seeing the delays that Manoel Urbano met with, owing to the necessity of fishing and hunting for subsistence, and accompanied mostly by a large number of Indians. The distance he travelled by land in three and a half days may be put down as about thirty miles. The report that the source of the Mucum reached the first falls of the Madeira is therefore confirmed, and the question of a communication existing between the Madeira and the Purús, at this point, now resolved.

After obtaining fresh supplies, Manoel Urbano ascended the Purús to the mouth of its affluent, the Ituxý, with the intention of examining the portage between this river and the Madeira. From the Mucum to the Ituxý occupied him ten and a half days. Ascending the Ituxý five days, he arrived at its affluent, the Puniciei. The depth of the river (Ituxý?) was found to be from  $2\frac{1}{2}$  to 4 fathoms, and is said to reach 6 fathoms in the wet season. A few villages of Pammanás, partly reclaimed from the wild state, were met with.

He entered the Puniciei, arriving at the end of five days' journey where the falls commence, which are two in number. A little below the first is situated a village of Hyppuinás, up to which the depth of the river is 2 fathoms. Three days further up the river scarcely admits of being navigated, being so choked up with trees and rapids. The width does not exceed 60 feet. On the 25th, Manoel Urbano continued his journey by land, and after four days' march he came to a rocky hill. Here he heard the sound of falls, but was not able to continue his journey for want of provisions. It is probable that the distance from the landing-place of the Ituxý to the Madeira is longer than that from the

Mucum to the Madeira, considering the longer journey by water on this river. Below the mouth of the Puncici, on the right bank of the Ituxy, is the mouth of the Puciarý, which is said to have no rapids or falls, and to flow through extensive tracts of open country. It is probable that a canoe may ascend farther by this stream, and thus the distance by land to the Madeira be much reduced. If, by ascending the Ituxy, the ascent of the current *Tres Irmaos* and the *Girao* falls of the Madeira can be avoided, there will be no doubt that this is the best way to the upper Madeira for the inhabitants of the Purús; but for those who descend the Madeira it will be better to pass the rapids and falls than to cross by the portage to the Purús.

When the left bank of the Beni becomes peopled the Purús will be of great service to the inhabitants, for they will be enabled to go by it in a straight course to the Amazons, avoiding the great *détour* by the Madeira. To the people of the Mamoré and Uaporé the best route is by the way of the Madeira.

J. M. DA SILVA COUTINHO.

# VIII.—*Notes on Peking and its Neighbourhood.*

By W. LOCKHART, Esq.

Read, April 23, 1866.

THIS city, the present capital of China, was originally called Yew-chau, from the Hun dynasty to the Wootae, or five kingdoms or principedoms,—202 B.C. to 950 A.D. It was called Nanking in the Liau dynasty, A.D. 1000, because the northern capital was beyond the Great Wall. Also called Pe-ping, or Northern Peace, in the Han dynasty, and by Hung-wu of the Ming dynasty.

In 1111 B.C., Wan-wang, of the Chau dynasty, named his brother Prince of Yen, who built a city on what is now the western side of the Chinese quarter or division of the city of Peking, and extended some distance to the westward; this was called Yen-king, and the ornamental marble work of this old city now forms the foundation-stones of the western portion of the walls of the present city.

About 1200 A.D., Gengis-Khan, the chief of the Mongol Tartars, took Yen-king, and his son Octai prosecuted his conquests, and put an end to the Kin dynasty.

In 1267, Kachilai Khan, nephew of Octai, and grandson of Gengis-Khan, destroyed Yen-king, and a little to the north-east of its site built another city, called Tatu, or King-ching, or Shun-teen-fu, or, as it is now called, Peking. This is the Kam-balik or Cambalu, the City of the Khan of Marco Polo. The Yuen or Mongol dynasty held their court at Peking from 1280 to 1368 A.D.; but when that dynasty was set aside in 1369, Hung-wu, of the Ming dynasty, removed the court to Nanking, where it remained till Yung-lo (the third of the Ming) having embellished Peking, made it his court.

THE CITY OF PEKING  
Survey by Capt<sup>n</sup> Bouvier. 1860

An tung men - Gate of the Allied  
armies in 1860

Te-sheng men

Tan

Tank

Bell Tower  
Drum Tower

Tung chih men

Si dah men

T A R T A R

Pou-tse men

IMPERIAL

IMPERIAL  
PALACE

R.C. Mission

Foreign Office

CITY  
Temples

Ta tsing men

British

Russian

American

French

Tung pien men

Si pien men

R.C. Cathedral

Shun-chi men

Tsien men

Ha-ta men

C H I N E S E C I T Y

Sha wo men

Sheng neng tan  
Altar to the  
inventor of  
Agriculture

Tien tan  
Altar of Heaven

Yun tung men

Tsang-tse men

Nan-si men

SCALE  
1 inch = 1 mile

The canal from Tung-chau to Peking was dug by the Mongols, who also carried through the far greater work of the Grand Canal. Tung-chau is twelve miles from Peking, and there is a difference of level of fifty feet between the two places. Hung-wu considered the city to be only the provincial capital of the north, and called it Peping. He reduced the size of the city, whose ramparts were at that time only composed of earth; and part of the old eastern rampart constructed by the Mongols still exists,  $1\frac{1}{2}$  mile distant from the present walls, outside the northern gates.

In 1410, Yung-lo took up his residence at Peking, since which time that city has always been the seat of the court and the capital of the empire. It was at this time that he cast the large bells which still exist. In 1437 he built the brick walls, and gave the city the form it now has; he built the towers of the drum and the bell, as watch towers for the guards, and also the enclosures of the Altar of Heaven, and of the temple of Shin-nung, inventor of agriculture.

In 1544, Kia-tsing built walls round the old or Chinese city, since which time both cities have retained their dimensions without change. Yen-king occupied part of the site of what is now the Chinese city, hence it is often called the old city. In the time of the Ming dynasty, the remains of the ancient city could be clearly traced; but since that time the faubourg, or suburb, has extended to the south, and obliterated all traces of it. The Chinese city is, indeed, merely a walled suburb to the northern city. Shun-che, the first emperor of the present or Tartar dynasty, did not change the laws and customs of the empire, but removed all the tribunals from Nanking to Peking in 1650, and divided the Tartar city among his chieftains, and the native Chinese resorted to the outer city; but in course of time these latter became more or less mixed with the Tartars in the inner city, and thus in both cities Manchoes, Chinese, and descendants of the Mongols of the Yuen dynasty mingled together.

Peking, being the capital of China, the residence of the court, and the centre of all the military and civil government of the empire and its colonies or dependencies, is a place of great importance. To it the tribute from the whole empire is brought. All the officers of the Government in the provinces are required to appear at court at certain intervals, and they all have agents among the retinue of the palace, or among the members of the families of the princes, who transact business for them, and defend their official administration as much as possible. To Peking also come ambassadors, or representatives, from the dependencies or tributaries of the empire. The most important of these are the Mongol princes or chiefs of the various tribes, who come attended

by many officers, soldiers, and servants to present their offerings and pay their respects to the sovereign as their feudal lord. These Mongol chiefs render suit and service by supplying a large contingent of cavalry in the Chinese army for any service to which they are called. Thus the late general and commander-in-chief, San-ko-lin-sin, who held the Taku forts against us in 1859-60, was a Mongol, and the head of the Kirchin or Caratchin tribe; he was finally killed in battle fighting at the head of his cavalry against some rebels in Shantung, when he was basely deserted by the infantry and other parts of the army.

There is much of state craft in the management of the Mongols. These tribes are very numerous, occupying, as they do, the wide and extensive plains of Mongolia. These people, once under Gengis-Khan and Kubilai, conquered China and for nearly 100 years held the sovereignty, and even now much is done to propitiate them. A large number of the cadets of the princely families become Lamas—the hierarchical form of Buddhism, called Lamaism, being the religion of the Mongols; and some very handsome temples and monasteries have been built in and near Peking, which are richly endowed by the emperor. In these monasteries 10,000 Lamas live and are well fed and provided for; and when their relatives from the steppes come to Peking, they find them living in much comfort and respectability, and are pleased thereat. But while the monasteries are thus sustained, these Lamas are held as a kind of hostages for the good conduct of their friends at a distance. The tie that holds the Mongols in fealty to the Chinese Government is but a loose one, and it is part of the policy of the latter to keep them thus in some kind of subservience. Among the things that help to do this, it may be stated that the Mongols are not at all a literary people; they are nomads, and keepers of horses and cattle, and they look up with respect and reverence to the more accomplished and studious Chinese, to whom they are indebted for all their literature, except the prayers and invocations to Buddha; and it is with the Mongols as with the Japanese, that they regard China as the seat of all literary excellence, and superior to all other nations.

The attendants of the Mongol ambassadors bring with them for sale in Peking large quantities of frozen game, wild boars, venison, antelopes, pheasants, hares, and fowls, also a large quantity of butter packed in the intestines of animals, felted blankets made of wool and camel's hair, which latter has the quality of being capable of felting.

It was curious to see the Mongol officers have their camel's-hair tents pitched in the court-yard of the houses allotted to them by the Chinese Government during their residence in the capital, the

rooms of the houses being used merely for out-offices. The Mongols said the tents were warmer and more comfortable than the rooms. This embassy always comes early in the winter.

The next embassy in point of importance is the Corean. The ambassador is attended by about 200 officers and servants, and troops who come under his escort. This embassy travels in carts from the peninsula of Corea, round the head of the gulf of Liautung, and occupies thirty days on the journey. The traders bring large quantities of the peculiar tough Corean paper for sale, used for windows instead of glass, large quantities of oiled-paper fans, Corean jinseng, thick cotton-cloth, and gold-dust to a large amount; and they take away various Chinese manufactures, as silks, satins, porcelain, foreign camlets and cotton goods, various drugs, and many Chinese books. The appearance of the Coreans is very peculiar; they dress chiefly in light-coloured clothes—the officials in silk, but the traders dress almost entirely in white Corean calico; they wear a high-crowned hat with a broad brim,—these hats being beautifully made of very fine slips of bamboo, varnished black, and held together by horsehair; they also wear a kind of hair-net or cap made of horsehair beautifully worked.

Besides the regular embassies, the Mongols and Coreans send officers before the end of the year, or rather in the 10th month, to obtain Chinese almanacks for use in their respective countries, which are both dependent on the Chinese Government for these publications.

*The general position of Peking.*—The city is situated on a large alluvial plain, about 150 miles from the sea on the east, and 10 miles from the hills on the west. The whole of the plain has been formed by deposit from the Yellow River, which once emptied itself into the sea in the Gulf of Pechili, even yet in some of the old native maps the name of the Yellow River is given to one of the districts. Since the neglect of the river-banks, resulting from the Taiping rebellion, and the rupture of these banks and consequent dispersion of the water, much of that great river-stream finds its way again into the same gulf.

There are two or three rivers which cross the plain. The Peiho passes some distance to the north of the city, and is joined by the Shaho from the hills to the north-west; the Hwan-ho, rising beyond the Great Wall, passes through the valleys between the western hills, then flows to the south of the Imperial hunting-ground, and eventually falls into the Peiho at Teen-tsin. There is also a small stream, which comes from the hills near Yuen-ming-yuen, and its water is brought into the city for the supply of the palace lakes.

The water for domestic use is drawn from wells, yielding an

abundant supply of good water, which is carried to the houses in tubs on carts and wheelbarrows.

The hills commence 10 miles to the east of the city, and are formed of sandstone, carboniferous limestone, and the coal strata. In one part there is slate, and the houses of the villages near the slate-quarries are covered with slates; discs of slate are also used in the city for the covers of water-jars. To the south-west, in the district of Fang-shan, there are extensive quarries of white marble, whence are dug the enormous blocks used for the figures of men and animals at the Imperial tombs, and for the construction of bridges, temples, and altars in and about the city.

There are many great strata of coal all through the hilly region to the west, north-west, and north-east, extending almost to Kalgan on one side, and to Jehol on the other; much of this is anthracite, but there is also a large quantity of excellent bituminous coal, and the investigations of those able to judge in this matter show it to be equal to the best steam-coal from South Wales, and sufficient in quantity to supply all the steamers in India and China. At present the coal-seams soon become drowned by water, as the Chinese have no means of raising the water beyond a slight depth, and are then obliged to discontinue their works and confine their industry to the surface galleries, where the seams crop out. If steam machinery were used, the deep coal of first-rate quality could be reached with advantage, but this the Government will not allow to be introduced.

The climate of Peking is very dry for the greater part of the year. Very little rain falls in the spring; in June, July, and August there are heavy thunder-showers, which flood the ground. In the autumn, again, there is little rain, and from November to March no rain at all, and but very little snow. The amount of rainfall for the year is about 26 to 30 inches. The thermometer rises in June and July occasionally to 100°; the average maximum for these months being about 90°, and the greatest cold experienced during the three winters I spent in Peking was 6° below zero, so that the range of temperature may be stated at 106° of Fahrenheit. During the winter the ice is usually two feet thick, and at this time very large quantities of it are piled up in deep pits, covered with mats and a layer of mud, and thus kept for use during the summer heat.

The city is supplied with an elaborate system of open water-courses and drains; these were made by the first builders of the city, and much improved by Keen-lung, but they are almost all now ruinous and in decay, and no water runs through them. Formerly there was, no doubt, a full supply of water to wash out these drains; but now no water comes to the city except the small



stream spoken of from Yuen-ming-yuen, which fills a large reservoir to the north of the city, and supplies the palace lakes and the Tungchau canal. The reason of this change is, that fifty years ago great inundations swept over the plain, broke down the bridges, tore up the beds of the small rivers, and destroyed the water-courses; evidence of the destruction caused by these inundations can be seen all through the country around, in broken bridges and blocked-up dry rain-courses. The political decay of the government having then commenced, no funds were at hand to restore these water-channels, and thus the whole system has become useless and inoperative.

*General State and Condition of Peking.*—In the middle of last century, Peking was one of the handsomest cities in the world; its grand walls, broad streets, large temples, and the palaces of the princes were all in their best condition. The great Keen-lung was then on the throne, and though he ruled the land with an iron sway, he did much good to all classes of the people, and spent very largely of his resources in improving and adorning the capital to his utmost ability. During his reign the empire generally was at the climax of its glory; he was a warrior as well as a man of great artistic taste; he trained himself by constant exercise, both in hunting and warlike excursions, and kept all his followers and soldiers for a portion of every year in the field, and lived with them in tents, moving about sometimes in one direction, sometimes in another. At this time China was looked up to and respected by all the surrounding Asiatic nations. In 1771, the remarkable flight of the 500,000 Taurgouth Tartars from the Caspian to China took place, and the remnant of that great host, after passing the lake of Tengis, or Balkhash, was received by Keen-lung with all welcome at Ili, where he was then hunting. The Russian Government remonstrated with the Emperor; but he replied, they were his own people, who once revolted, but had now returned to their allegiance, and he should protect them to the utmost. He did protect them, gave them land, and they have remained in China ever since.

In 1793 Lord Macartney's embassy went to Keen-lung and saw the Emperor, but nothing came of it beyond the passing of compliments. To this embassy we are indebted for a largely increased knowledge of the country; and much attention was thus attracted to China and its affairs. Keen-lung abdicated the throne after a sixty year's reign in favour of his son, in the hope that he might see his son rule with vigour in his stead; but after his death, which soon followed his abdication, Kia-king did not follow his father's example, gave way to luxury and vice, and neglected the government altogether: thus the empire gradually fell into trouble, became much impoverished, and has never been able, on account

of the incapacity of its rulers, to recover itself. Constantly becoming weaker and weaker, it has at length reached its present degenerate state. Kanghi and his grandson Keen-lung were strong, able, and wise rulers; and, despots though they were, they did all they could to make their kingdom great and prosperous: they were also both men of great ability, and lived in much abstemiousness and frugality, so far as they were personally concerned;—ever ready for instant action, either in the court or in the camp: but they have had no worthy successors. What is true regarding Chinese families is also true regarding the empire generally. A man of ability and industry accumulates a fortune, raises his family, buys a large extent of land, erects a large mansion, and becomes a person of great importance in his district; probably his sons will still keep up the family possessions, but their descendants give way to carelessness and dissipation, and the fortunes of the family gradually decline: very soon the house falls into a neglected state, and little is left to the members of the family beyond the tradition of their former grandeur. So it is with the dynasties,—the talents and energy of the first rulers gave them firm possession of power, and they established their throne on a broad foundation; and as long as their successors followed their example, and lived abstemiously, and, by attention to the government of the provinces, retained in their own hands a strict rein on the officials of every rank and grade, the country prospered; but by degrees the rulers became luxurious, and heedless of the cares of their government; the revenues declined, the provincial authorities oppressed the people, discontent and turbulence took the place of good order and discipline, and rebellions of greater or less importance have exhausted the resources of the country. Thus the whole land becomes impoverished, public affairs are thrown into confusion, fresh rebellions arise and produce their dire effects in the depression of all Imperial rule, and then some energetic rebel chief takes possession of the vacated throne, inaugurates with vigour a new dynasty, and rescues the country from its low and ruinous condition. For the first 150 years of this Tartar dynasty the empire was flourishing and prosperous, owing to the careful rule of astute sovereigns; but for the last seventy years power has declined, and the government is now much reduced. The *people* have great wealth, but so little revenue goes to Peking that the court is in a very poor condition, the palace is neglected and almost ruinous, the capital has much decayed, all the best buildings are falling into ruin, and signs on all sides give evidence that the Tartar sway is becoming weaker and weaker, and ready to yield to some stronger hand.

The walls of the Inner or Tartar city are built of large bricks, and consist of outside retaining walls, enclosing a mass of earth

and stones, which has a thick layer of concrete at the top, and this is covered by bricks. The wall thus constructed is 36 feet high, having a parapet of 6 feet on both sides; the breadth at the top varies from 40 to 52 feet, and is widest on the north side of the city. The circuit of the walls of the Tartar city is  $14\frac{1}{2}$  miles, the extent from north to south  $3\frac{1}{2}$  miles, from east to west  $4\frac{1}{2}$  miles. There are nine gates; three on the south, and two on each of the other sides: the central south gate, or Meridian Gate as it is called, is directly opposite the great gate of the palace; through it the Emperor passes when on his way to the Altar of Heaven or to the imperial hunting-grounds. Through this gate no coffin is ever allowed to pass. One of the gates in the north wall is the Anting Gate, which was given up to the English and French generals when the allied armies encamped in the large plain outside this gate in 1860.

The Governor of the city is called the General of the Nine Gates, and is an officer of high rank. The captaincy of each gate is given to the imperial princes, who derive a portion of their personal revenue from what they can obtain over and above the real tariff exacted from all traders taking goods into the city; even the peasantry passing through with their baskets of provisions have to pay for the privilege, and I have seen the gatekeepers, who keep for themselves all that they exact in kind, require a man with a basket of eggs to give them one or two on passing. The camel-drivers, who bring coals from the mountains, also give at each gate a lump of coal as their tribute.

The gates consist of an inner gate in a lofty arch: this opens into a large enceinte, enclosed by a wall of as large dimensions as the original wall, and at the side of this enceinte is the outer gate. The enceinte of the meridian gate encloses a large space used as a review ground, to which there are three gates, one on either side, and the Emperor's gate in the centre. In this space are also two shrines to the God of Wealth, one of which was in fashion as a great resort for the shopkeepers, who flocked to it in immense numbers on the appointed days for presenting their offerings of candles and incense. Over both the inner and outer gates lofty handsome and square buildings or towers are erected, which are called forts, and are pierced for wall-guns and musketry. Some of these towers contain a large quantity of cannon. The gates are closed with much ceremony every evening shortly after sunset, and only opened during the night on occasions when some high officer requires to pass through.

The walls of the outer or Chinese city are not so large as those of the Tartar city. Their length or circumference from the south-eastern corner of the latter to the south-western corner is 10 miles, being  $2\frac{1}{2}$  miles from south to north, and 5 miles from east to west.

The entire circumference of the walls enclosing the two cities is 20 miles, leaving out the south wall of the Tartar city, which is enclosed by the wall of the Chinese city.

Kia-tsing, of the Ming, purposed to carry the wall of the Chinese city round the outside of the wall of the Tartar city, then to have a second or outer enclosure; but he had not funds sufficient for the work. Hence it is that the Chinese city projects on the eastern and western sides beyond the walls of the chief or Tartar city. In this Chinese city there are seven gates: three on the south face of the wall, two on the east, and two on the west; besides the gates that open out of the Tartar city.

The walls of the Tartar city enclose two other so-called cities, which have their distinct walls one within the other. The first is the Hwang-ching, Yellow or Imperial city, from the walls being coloured yellow, and inside this is the Tse-kin-ching, Forbidden city or palace, with red-coloured walls, which occupies the centre of the whole, and where the Emperor lives in the winter-palace. This is an extensive range of buildings, courts, temples, and handsome pavilions, for the use of the court. Many of these buildings have very richly glazed yellow-tiled roofs, but they are in great want of paint, and look almost ruinous. No European is ever allowed to enter the Forbidden city.

The civil government of Peking consists of two magistracies or districts, called respectively the Wan-ping and Ta-shing districts. The magistrates placed over them are subordinate to the Shun-teen-fu, the prefect or chief officer of the Shun-teen department. These officers have the usual subordinates connected with them in the management of the city, but it is not necessary here to allude to them in detail.

The garrison of the city is composed of the bannermen, the descendants of the adherents of the various Manchu Tartar chiefs who helped to conquer China in 1644. These chiefs settled in Peking with the title of princes, and had portions of confiscated land given to them, on which they built residences or palaces for themselves, called Fus. These buildings are generally in a ruinous state; but some of them are very handsome. Many of these Tartar princes of the Conquest, as well as the imperial princes or descendants of the royal family, lived in Peking. The bannermen or soldiers of the pa-ke, eight banners, are not amenable to the civil jurisdiction of the magistrates, but are wholly responsible to their own officers; in fact, are under the military laws of their own class.

Kanghi, the second Emperor of the present dynasty, who reigned sixty-one years—from 1662 to 1723—was much engaged in establishing his imperial power, and did little for the embellishment of Peking. He compiled his great dictionary, and caused

the survey of China to be made, and the large map to be engraved by the Jesuits, who during his reign were intermittently in favour and disgrace, on account of discussions regarding the question as to whether the worship paid to ancestors was a civil or an idolatrous rite. He was, on the whole, a wise and judicious sovereign, and succeeded in consolidating the empire. It was during the reign of his grandson Keen-lung—from 1736 to 1795—that the chief buildings and temples of Peking were erected, and it is very noticeable that, if attention is excited by the beauty of any structure, either in stone or bronze, it is almost invariably found to bear the name of Keen-lung. He was a man very fond of the fine arts, and possessed much good taste: and while he greatly extended the empire to the westward, and by his rigorous rule maintained his power over the whole land, he greatly improved and embellished his capital, and also by his literary abilities was able to superintend and have carried out the publication of some most beautiful and valuable Chinese books.

*The Streets of Peking.*—The whole city is crossed from north to south by two long and very broad streets, and on each side of the palace they proceed direct from two of the south gates, and are quite straight for about 3 miles, when they turn towards the northern gates, which are not in direct line with the southern gates. These streets are crossed by two large streets from the eastern gates to the western, and at the points where they intersect there are very large wooden erections on pillars, called triumphal arches or gateways. They are, in fact, memorial gateways, without the gates or valves. These great streets are crossed by many broad streets, and these again by an infinite number of narrow streets, called Hutungs, or lanes. The great streets are lined by private houses and shops, with the richly carved and gilded fronts peculiar to Peking. Next to the houses is a broad pathway. The centre of the street is raised about two feet, to form a carriage-way, and between this central part and the footway, in the busy parts of the city, and especially near the cross-roads, there are on both sides long lines of wooden huts and shops, which much obstruct the streets and give them a mean appearance. The streets are not paved, the roadway being only of earth, in consequence of which the streets in dry weather are extremely dusty, and in wet weather almost impassable from the depth of mud which is produced by the constant passage of carts. In some of the streets below the general level I have seen the whole of the roadway for half a mile covered with two or three feet of mud, in which many carts were wrecked and overturned, to the great discomfort of the persons riding in them.

Large numbers of beggars are seen in the streets of Peking. A subordinate officer, who may be designated as king of the beggars,

is in charge of them, and is responsible for their good conduct. They go about the streets of the city, and can remain at the door of a house or a shop, and clamour for relief until a copper coin is given to them, when they must move on. During the summer they lie about the streets and in doorways, in the winter they congregate in ranges of huts provided for them. Here they pay a small sum for the coals used to warm the stone bed-places, on which they sleep in long rows, and thus keep each other warm. These huts are kept tolerably clean. The whole assemblage is turned out in the morning; and it is a curious sight to see these beggars leaving their night quarters to pursue their avocations in the streets. No public provision is made for this class of the community, but the shopkeepers acknowledge their right to claim relief; and during the cold weather subscriptions are raised to provide a bowl of hot rice-gruel or millet-porridge for every one that applies for it. Outside each of the gates, and at various temples, kitchens are opened for this purpose, to which great numbers of the poor resort in large crowds every morning, and all applicants, whether beggars or the poorer class of work-people, are relieved.

*The Public Offices of Government, &c.*—The Nuy-ko, or imperial cabinet, meets in the palace itself.

On the south side of the palace, in the Tartar City, are situated the various offices of the general government of the country, chief among them are the six Tribunals or Boards: the Tribunals of Civil Office, Revenue, Rites, War, Punishments or Criminal Judicature, and Public Works.

These tribunals have large buildings for the performance of their several functions, but these are for the most part little used, —except those of Revenue and Punishments, which are fully occupied—the general work of the departments being conducted at the houses of the officers, the public offices being only used on State occasions. The presidents and vice-presidents of these tribunals—more especially the former—are officers of high rank, and, in fact, Secretaries of State. They and their subordinates are selected both from the Manchus and Chinese in about equal numbers; two or three Mongols are also among the number. Besides the above, there are the—

*Tsung-jin-fu.*—Officer for the control of the Imperial household.

*Le-fan-yuen.*—Colonial office for the management of all affairs connected with the Mongol, Corean, Thibetan, and Mahomedan embassies.

*Tsoo-cha-yuen.*—The Censorate, one of the most important posts of the Government. These Censors have the right to blame the action of all departments, and even control the Emperor him-

self; but they are made responsible for the truth of their representations, even to their own lives.

*Han-lin-yuen.*—The Imperial University, or Hall of the Literary Chancellors. These regulate the examinations of candidates; record the daily actions and words of the Emperor, often much to his annoyance; prepare public documents, and receive memorials, &c. I saw the celebrated library connected with this office, but it was in a very dilapidated condition and the valuable books much exposed to the weather.

*Kin-teen-keen.*—Astronomical Board, with which many of the most able of the Jesuit missionaries were once connected. This office has charge of the observatory, where the observations are recorded; it also prepares the Almanac.

*Tu-E-yuen.*—Great Medical Hall; and various offices for regulating the supply of horses and camels for public service, for providing sacrifices of various kinds, for regulating sacrifices and ceremonies at the public temples and altars in Peking.

Not far from the Roman Catholic cathedral there are the extensive stables and yards where the Imperial elephants were kept. These animals were used in processions and on great state occasions. In Keen-lung's time there were eighty or one hundred elephants kept: when I visited the place there was only one elephant—a very old one, and he shortly afterwards died, and the stables are now empty. The beasts were brought from Burmah and Siam as presents to the throne.

The common execution-ground is situated in the Chinese City, at one of the cross-roads, which is usually occupied by a vegetable market; and the place is, in fact, called the Cabbage-market. When an execution is to take place the stalls are cleared away, and the criminals are beheaded on a pile of rubbish in the street. The heads are placed in small wooden cages, and slung on short poles stuck in the earth. As soon as the execution is over the market goes on as usual, and I have often seen a dozen fresh heads in their cages among the vegetable stalls, the passers-by taking no notice of the circumstance. It is here that the great autumn execution takes place, when a large number of criminals are executed, so as to clear the prisons before the sacrifices to heaven by the Emperor at the winter solstice. It is at this place that political offenders are executed; for the ex-Ministers who have not carried out the plans of the Government satisfactorily are usually put to death. Su-shun, the ex-Regent of the empire, was beheaded here in November, 1861. He had abused the confidence of the Emperor, and also had issued vast numbers of bank-notes in connexion with several banks he had in the city. These notes were used for large payments to contractors for Government works, and to shopkeepers for the supply of the

Court, but he afterwards refused to redeem them; and as I rode along the street through which he was to pass to his execution, I found both sides lined with those shopkeepers and bankers who had lost heavily by this trick, standing there to jeer him as he passed. Shortly after I arrived on the ground the public executioner and his attendants arrived in their carts, and then Su-shun himself was driven up in a common cart, and passed quite close to me. The cart stopped; he got out, was encircled by a number of officers bowing to him, and was at once executed.

Here also was executed Ho-kwei-tsing, ex-Governor-General of Kiang-nan. He was flying from Su-chau, when that city was attacked by the rebels. The inhabitants tried to prevent his escape, and he ordered his soldiers to fire upon them. For this he was condemned: at least, this was the excuse; his real crime being his unsuccessful defence of Su-chau. This man had powerful friends in Peking, and, lest they should attempt to rescue him, he was awakened one morning before sunrise, hurried to the Cabbage-market and there executed.

In 1860, General Shing-paou was commander-in-chief of that part of the Chinese army which held the high road between Tung-chau and Peking, and had its chief position on and around the bridge called Pa-le-chaou. Being wounded in his unsuccessful defence of this bridge, in his rage and annoyance he beheaded, or ordered to be beheaded, his two prisoners, Captain Brabazon and Abbé de Luc. After this he was made commander-in-chief of the Chinese army in the central provinces, but was defeated by the rebels, and in consequence various accusations were brought against him. He was called up to the capital as a prisoner, and tried by the Hing-pu, or Board of Punishment, in whose prison he was lodged. He was condemned to death. It was expected that the efforts made by his powerful friends at court for the reversal of the sentence would have been successful, and large bribes were offered, and, it was said, were accepted, to have this carried through, and Shing-paou did not at all suppose that he would have to suffer. One day he had appointed a band of play-actors to exhibit before him, and his family were to join him on the festive occasion; but early in the day the President of the Board of Punishment came into his rooms, and announced that he had an edict from the Court to read to him. He dressed himself in his court robes, when, to his disgust, he found, instead of an order for his release, that the edict was the sentence of death, issued by the Dowager Empress, as chief member of the Regency. He protested against this; but the President told him the orders were immediate and must be obeyed; and at last, after much angry discussion, he was forced to mount a table, a noose thrown over a beam was placed round his neck, the table was removed,



and he left pendant. His body was given to his friends; and as he did not die by the sword of the executioner, it was reported to court merely that he had died in prison, and the whole of his family and property were not sequestrated, as would have been the case had he died in the Cabbage-market.

In the north part of the "forbidden" city are the park and gardens of the palace, in the centre of which is the very beautiful picturesque hill called Kin-shan, crowned with very pretty pavilions. This hill was made by the earth dug out of another part of the grounds to form the two lakes on the west side of the palace. One of the Ming emperors raised this hill, and it is said that he first gathered an immense quantity of coal for the foundations of the hill, so that should the city be besieged there would be an abundance of coal for the use of the people. This park is the resort of the members of the Court on summer evenings. On one of the trees on the side of the hill the last emperor of the Mings hung himself in 1643, after he had witnessed the suicide of all his family. This was done lest he should fall into the hands of the rebel Le when he had taken Peking.

In the centre of the most northern of the two lakes is an island, with a pagoda on the top of it. It is made of marble and stone which formed a mound built originally at Kai-fung-fu, in the Sung dynasty. The whole mass was brought to this place overland during the Kin dynasty, it is said. Round the lake are several large Imperial temples, which are very handsome. One of the principal priests came to me for surgical aid as a patient, and invited me to see the temples, which well repaid a visit. They are all beautifully built, and situated in most picturesque positions on the edge of the lake. The temples, terraces, and pavilions are all in perfect order, and are used for the Imperial worship. In the largest of the temples there are 10,000 small gilt bronze images of Buddha ranged in cells all round the walls of the immense building, which has three lofty stories. The face of one of the walls in front of a temple is covered with slabs of porcelain, with large dragons in very high relief, which is the finest specimen of that kind of work that I saw in Peking. In one of the temples is a very large image of Buddha, 70 feet high, with 1000 arms disposed in semicircular rows on each side; it has also 1000 feet or sets of toes, and a vast number of small heads, arranged like a pyramidal crown on the large head; in one hand is a great umbrella, with the handle formed of a lofty spar, and the figure sits on a mass of figures of men and animals.

Outside the north wall of the city is the Altar of Earth; on the east face is the Altar of the Sun; on the west face that of the Moon; and outside the south wall, but in the Chinese city, are the altar to Shinnung, the founder of agriculture, and the Altar of

Heaven. All these altars are large and handsome structures, surrounded by two or three walled enclosures or parks. At certain times the Emperor himself, or in his stead various high officers, go to these altars and offer the sacrifices, for the performance of which there is an appointed order and ceremonial. The chief of these altars is that dedicated to heaven, namely, the Teen-tan, in the south part of the Chinese city, where the Emperor goes during the night preceding the winter solstice to make his offerings to heaven. These altars signify in China the residence of the rightful sovereign, and more especially is this the case in regard to the Teen-tan, where Shangti is worshipped by the Emperor. The idea of this altar, as the Yuen-tan, or Raised Hillock, dates from the Chau dynasty, about 1200 B.C., when it was carried out in Sigan-fu, and the erection of an altar of this kind has since been one of the chief signs or manifestations of Imperial sovereignty. Shun sacrificed to Shangti in B.C. 2230. This altar in Peking was built in 1430 by Yung-lo of the Ming, soon after he removed his Court from Nanking to the north. It was much beautified by Keen-lung. In the worship carried on here the Emperor acts as a high priest. He only worships; and no subject, however high in rank, can join in the adoration. His officers stand round him on the lower terraces of the altar; and while the bodies of oxen are burned on a large square altar near at hand, and various other burnt-offerings made, he kneels down, offering incense, while the appointed officer recites certain prayers, and a large band of musicians and singers raise a song of praise. There is no idol or picture or other representation of this Shangti, and it is believed, by many persons well qualified to judge on this point, that the worship is the remains of the traditional Monotheism derived from the Jewish worship, and that Shangti is the true God or Jehovah, however low may be the Chinese idea regarding Him.

The Teen-tan is a beautiful place. The whole area, which is about a square mile, is enclosed by a solid wall; inside this is a large park, with fine avenues round it; in the centre is another enclosure, containing two large and lofty circular marble altars, rising by means of three sets of broad steps divided by terraces, and each set of steps and terraces enclosed by handsome carved marble balustrades. The north altar is that to the Vault of Heaven, and the centre of the flat top of the altar is occupied by a lofty pagoda, with a series of three projecting roofs covered by glazed blue tiles, the highest conical roof terminating in a large gilt bronze ball.

In this pagoda or temple are tablets or representations of the stars and constellations, in fact, the host of heaven, which are here worshipped, that the country may enjoy favourable seasons.

The court of this altar is surrounded by large buildings, one of which is for the large tablets of the former emperors of this dynasty, whose manes are here worshipped; the others are for the officers and their attendants, and for the vases and other vessels used in sacrifices, and there is a very long covered gallery, leading to the buildings where the cattle are slain for the offerings. The courtyard is approached on the west side by a large stone incline; on the south side a large stone and brick causeway leads to the south altar, properly the Altar of Heaven. This is also circular and very large, built of marble with steps and terraces; but on its flat top, about a quarter of an acre in extent, there is no temple or other building,—it stands alone in its enclosure, and there is no building near it, except one beautiful small pagoda-like temple with blue roofs, where the tablet, having inscribed on it the name of Shangti, is kept, and whence it is taken to be placed on the altar. It is on the top of the terrace itself that the Emperor worships and presents the incense; near the grand altar there is a square altar, where the burnt-offerings of oxen are made, and close to this the large iron braziers, or baskets on tripods, in which the offerings of silk and cotton are burned, and also for the burning of incense. In proof that burnt-offerings are thus made I have picked the burnt bones of oxen out of the altar, and shreds of silk out of the braziers.

In one part of the grounds is a large building, called the Palace of Penitence, where the Emperor is supposed to spend some hours in humiliation before he approaches the grand altar. In other parts of the park are several large buildings, for officers, guards, and attendants, and a large slaughter-house, for preparing the bodies of the oxen for sacrifice. Near the entrance of the park is a large enclosure, where the peculiar black cattle are kept which are used for sacrifice; between this place and the outer gate is a village in which the musicians used on state occasions live.

This Altar of Heaven is the most interesting of any of the Chinese temples I have seen.

Near to the Teen-tan, on its west side, but divided from it by the very broad road which runs through the Chinese city from north to south, is the Altar of Shinnung, the founder of agriculture. This also has extensive park-like grounds, enclosed by a wall. In the centre are two or three square altars, one to Shinnung, one to the seasons as under the protection of the planet Jupiter, and another to the fruits of the ground. In one part of the park is a piece of enclosed ground, which the Emperor assists in ploughing, that is, he touches the plough and scatters a little grain, he then sits on a raised terrace to witness the remainder of the work. The produce of this imperial field is used in sacrifice.

In a handsome stable-yard, the beasts kept for ploughing live for a time; here also the imperial implements of husbandry—ploughs, harrows, rakes, &c., &c., all painted red—are carefully stored: there is also a small model granary, for holding the imperially cultivated grain. The purpose in view is, that the Emperor desires to confer honour on the pursuit of agriculture, as producing the means of life, and when he has presented gifts on the shrines, he then joins in the labour of the field.

In the west part of the Tartar city, there is also a very handsome temple, called the Temple of Light; it is somewhat in need of repair, but is a very tasteful structure, and well worthy of attention.

The Temple of Confucius, in the north of the city, is a very beautiful building. The large hall contains the tablet to the "Teacher of 10,000 ages," the tablets to Mencius, and the other tablets of the sages and disciples. The hall is very large and beautifully decorated; suspended from the roof are the gilded and richly carved memorials in honour of the great sage, from each of the emperors of this dynasty. The court-yard contains many old yew-trees, which were planted in the Yuen or Mongol dynasty; in the same court are some large marble tablets, the gifts of emperors. At the main entrance to this court are the ten stone drums made of granite, and covered with inscriptions in ancient seal characters, said to be of the date B.C. 800, and to have been brought from Lo-hyang, then the capital of the Chau dynasty. In the outer court there are many stone tablets, several of them of the Yuen and Ming dynasties; the names of the higher orders of graduates are carved on these stones after the examinations, and it is considered a great honour to have the name thus inscribed in the great Imperial University. The offerings to Confucius generally consist of fruits, &c., but on the day that the Emperor or his deputy worships at the shrine, offerings of slain beasts are made.

There is another literary establishment close to the Confucian temple, where the Emperor grants degrees to Manchus, as much attention is paid by this dynasty to promote learning among the race of Tartars from which it sprang. Within the enclosure are various spacious buildings: in the centre is a raised marble terrace, on which is placed the Imperial pavilion, an exquisitely beautiful structure; the only furniture it contains is a yellow chair, on which the Emperor sits and confers his favours; round the terrace is a circular moat, walled with marble, and over the road by which his Majesty enters is a magnificent three-arched gateway, covered with glazed tiles ornamented in high relief. Round the court are corridors, in which are very many stone tablets. On these the

whole text of the Chinese classics is carved in pages, so that they can be printed off, and form a standard imperial edition of those highly-valued works.

The Observatory is placed contiguous to, and partly on the east wall of the city. It is a square tower, 60 to 65 feet high; the present structure was built in the Ming dynasty. The Mongols had an observatory here, and the large bronze astronomical instruments and stands in the lower court-yard, are said to have been made by them. Verbiest and others of the Jesuit missionaries made finer instruments for the Emperor, which are now on the top of the tower. The most remarkable of these is a large bronze celestial globe 6 feet in diameter, most carefully cast: this and the large armillary spheres and transit instruments were cast in Peking; one large transit instrument was made in Europe, and sent out early in the last century as a present from the King of France. Observations are still taken from the tower, but the bronze instruments are not now used.

The Public Hall or University for literary examinations is very near the Observatory. It consists of a large walled enclosure of some four acres; on one side are the entrance gates and some halls. In the centre is a three-storied pavilion, where the superintendent and his immediate coadjutors sit and inspect the whole area, which is divided and subdivided into numerous narrow passages or lanes, lined with small 4-feet-square cells, in which the students sit during the examinations, and write their theses. There are 10,000 such cells, additional cells can also be erected, and 14,000 students have been examined there at one time, though this is unusual—not more than 6000 were present at any examination while I was in Peking. The people had been so much impoverished by various rebellions in the north of China, the roads become so very unsafe, and the Grand Canal fallen into ruin from neglect, that the students did not frequent the capital so numerously as in more prosperous times.

The largest Lama Monastery and series of temples in the city is inside the Anting Gate. It is said to contain 2000 Lama priests—Yung-ching, the son of Kanghi lived here during his minority. The establishment is a kind of metropolitan cathedral, and the full choral Buddhist service is performed there, and the chanting of the Lama Liturgy is very surprising, especially when the priests burst into a full and loud sounding chant, the bass voices being aided by some enormous horns or trumpets. It was a striking sight to see the priests in full dress conducting the service. In one of the large temples there is a very great image of Buddha, 60 feet, almost as large as the one spoken of as seen in the Palace temples.

In the year 1410, Yung-lo, of the Ming dynasty, cast the

three large bronze bells which still exist: one is over one of the palace gates; the second is in the tower of the Bell—on it the day and night watches are rung; the third, and largest, is in a temple to the north-west of the city. It is the largest bell extant that is suspended and in use; for the Moscow bell, which is larger, is on the ground, and is also broken. This bell is used when rain is prayed for by the priests; it is 15 feet high, and its ears for suspension are 10 feet more—thus it is 25 feet in height; across the mouth it measures 11 feet, and is 9 inches thick; it is made of fine bell-metal, is covered with characters within and without, constituting one of the large Buddhist collection of prayers—these characters were cast on the bell when it was made, and were not cut out afterwards; the weight is 120,000 lbs. or 60 tons. It is a fine specimen of casting, and perhaps could not be excelled even now in Europe. It is stated in a letter of Verbiest, quoted in Kircher's '*China Illustrata*,' written 200 years ago, that an iron bell, cast at the same time as these bells, lay in a court-yard near the Bell Tower. I went to look for it, and found it in the very place spoken of so long ago; it has probably never been removed from the place where it was originally cast.

*Yuen-ming-yuen.*—The former summer palace of the Court was a city of palaces enclosed by a wall. The space thus enclosed is at least 6 miles round. It is situated 10 miles to the north-west of the capital, to which there is a road paved with slabs of granite. The Emperor and his Court chiefly resided at this place. The palace in Peking was only used occasionally. Yuen-ming-yuen was a beautiful place before its destruction by the orders of Lord Elgin in 1860: the burning of the palaces was a measure rendered imperative, as a means of teaching the Chinese Government, that they could not with impunity commit acts of treachery and cruelty against persons whom they had entrapped into trusting to their professions of peace, and then violently seized and tortured to death, and even at this royal residence exhibited in their tortures, for the amusement of the inhabitants.

The first thing that is seen on the stone road leading from Peking is the lake and its islands, on which are several temples. A long marble bridge of eighteen arches connects one island with the road, and at the foot of the bridge is a bronze figure of a cow, as large as life, reclining on its pedestal: it is a very fine casting and was made by Keen-lung. There is a local tradition regarding it, and it is supposed to be a guardian of the locality. The road winds round the lake, and leads to a large open space before a guard-house and some great gates; in front of the gates are two colossal figures in bronze, of lions on great pedestals: these and the great figures in bronze of various animals at the other palace gates, are splendid specimens of castings, and are very valuable.

These gates give entrance to a large park-like enclosure, on the edge of the lake. In the centre of the enclosure is a fine hill, which is covered with the ruins of large temples and pavilions, where the members of the Court come for worship, and also to spend the summer evenings in the cool air from the lake. The temples are richly ornamented, and broad steps lead up the face of the hill, alternated here and there by handsome pavilions. On the top is still remaining a very fine temple and summer-house, covered with glazed tiles both on the walls and roof. From rock seats in front of this building there is a beautiful view of the pretty lake and its islands, capped by pavilions and temples, while across the plain are seen in the distance the mountains to the north. In another part substantial stone terraces have been built with great labour against the steep face of the hill-side: on one terrace there is a fine white marble gateway, recording the glories of the place, and on a terrace above this is an exquisitely constructed little temple, dedicated to the spirit of rain; it is wholly built of bronze, cast in imitation of carvings in wood. The temple appears as if it were a very richly carved wooden structure, with its pillars, doors, windows, and beams of the roof and eaves all elaborately carved, with the various ornamental tablets in richly carved frames; but all is of thick copper and bronze. The whole is 16 feet square and 25 feet high. The date is of the time of Keen-lung, and it is the largest and richest piece of bronzework I have seen.

Other parts of the hill on both sides are pierced with galleries constructed in the rock, leading to terraces and various temples. On one terrace there is a very large perpendicular tablet on its pedestal; on the face of the tablet is cut in large characters the name of the place, "The hill of 10,000 ages (Imperial Hill), on the clear bright lake."

All the large temples and pavilions were destroyed in 1860, the temple at the top, the copper temple, and round small temples alone excepted. The whole place was once very beautiful.

Two miles to the north of the lake, Yuen-ming-yuen is situated. No one but the keepers of the grounds is allowed to enter, but I rode round the outside of the place on two or three occasions. On one side I found the gate at which Lord Macartney had entered, when he and his suite came here after his reception by the Emperor at Jehol. Continuing to ride round the walls I came to the now bricked-up gate on the north side, by which the French entered the place in 1860, and a mile or two further on I came to a series of high mounds outside the walls, from the top of which much of the interior of the place could be seen. All the buildings had been burned, but the remains showed that they had been beautifully built and richly decorated. In one place was the great hall of

audience and its terraces, all covered with glazed tiles, having ornaments in high relief; in another direction were a series of temples and a beautiful pagoda, covered all over with green porcelain tiles; and lastly, there were the extensive ruins of what was called the Italian Palace, designed and built by some of the European missionaries: it was built in good taste and stood on a large terrace, on the balustrade of which were rows of vases and other ornaments which had escaped destruction. In the gardens round this palace were several pavilions and summer-houses of European design, and the whole looked like a picture of a European palace, standing in the ornamental gardens of the last century.

The above formed but a small part of the buildings of Yuen-ming-yuen. The walls extended in all directions through the richly wooded park, sheets of water stretched away in various parts, and the place must have been one of extreme beauty. Workmen were engaged in some portions of the grounds, clearing away the rubbish and picking out the still unbroken porcelain bricks and tiles; but no attempt at rebuilding any of the structures is made.

The Imperial hunting-ground, or Hae-tze as it is called, is 3 miles outside the south gate of the Chinese city: it is a tract of country enclosed by a wall 40 miles long, being thus a square of 12 miles. The Emperors Kanghi and Keen-lung used often to hunt there. Several villages are in the enclosure, which is given up to pasture: herds of oxen and horses, and flocks of sheep for the use of the Court are fed there, and great numbers of deer are seen in all directions. It is simply an Imperial domain, and was used as a hunting-ground by the Court, when public business did not permit a sojourn to the wild hunting-grounds of Tartary.

There are several very handsome marble bridges in and about Peking, especially the one which crosses the junction between the lakes in the palace-grounds; and the long bridge connecting an island in the lake at Yuen-ming-yuen with the road. Each of these bridges has eighteen arches. Many other fine bridges cross the water-courses in the plain.

*Elephants, Mules, Horses, Camels.*—The draught animals used in Peking are camels, horses, donkeys, and mules. The camels (Bactrian camels) are grown in Mongolia, and they are almost all sent into Mongolia during the hot months of summer. They are used for bringing coals and lime from the mountains, and also for bringing the pea-oil from the neighbourhood of Moukden: great numbers of these animals are kept for this service. The horses are small sturdy animals and very hardy. The mules are used for riding, but chiefly for the small carts or street cabs, which are much used in this part of the country. At the city gates and other places of great resort there are regular cab-stands, where 100 or more of



these small mule-cabs stand for hire. The mules are very fine large animals, and some of those in the service of officials are really splendid beasts.

The Roman Catholic Cathedral, near the south-west gate of the city, was originally built by the Portuguese missionaries, in 1657. The first building was burned down many years ago; but Keen-lung (as I understand from the tablets in the yard) gave a liberal donation towards the present church, which is a handsome structure. In front is one of the usual Chinese stone gateways, with the inscription "Via regia cœli, 1657" on it. When the European missionaries were expelled from Peking, the place was closed and the doors bricked up; and the Russian ecclesiastical mission had it in charge, and took care of the valuable library. In 1860, the French Ambassador, Baron Gros, took formal possession of the then almost ruinous building, which has since been completely repaired, and regularly used for divine worship by the Chinese Christians, who assemble there in large numbers. The Jesuit cemetery, called the Portuguese Cemetery, is outside the West gate, where the early Jesuits were buried; and there are many monumental stones erected to the memory of those who died at Peking: several of these stones were gifts of different emperors. Here lie the bodies of Ricci, Schaal, Verbiest, Longobard, and many other men of renown. On the opposite side of the road there is a smaller cemetery where there are some twenty graves, chiefly of Dominicans and Franciscans.

Besides these, there is a large French cemetery, some distance to the west, where the later Jesuits, chiefly Frenchmen, were buried. Here lie Cibot, Amvot, Gaubil, Gerbillon, &c. In this place the French officers and soldiers who died before Peking, in 1860, are buried; and it has since been walled round and repaired by the French Government, and is used for interment of any French subjects who die at Peking. There is another cemetery used by Chinese Christians which is outside the south-west angle of the city; in this there is a large tomb containing the bodies of five Portuguese who died in 1624, in the Ming dynasty, probably persons who were in the employ of the Chinese Government as military instructors or perhaps artisans (I could not find who they were exactly, but the imperfect inscription showed that they had been in prison, and might have been officers attached to a Portuguese embassy imprisoned by the Chinese Government).

The Russian cemetery is situated outside the Anting Gate, and contains several monuments of archimandrites, and other members of the Russian ecclesiastical mission, who have died in Peking. Here also are the graves of the four English prisoners tortured to death by the Chinese in 1860, and for the present buried in this

Russian cemetery by the kind consideration of the Russian Minister-Plenipotentiary, Baron Ignatief.

The British cemetery is on a piece of ground outside the city, to the westward; and to this place the bodies of the prisoners are to be removed as soon as possible: probably this has already been accomplished.

*Chang-ping-Chow — the Tombs — Nankow Pass — Chatau.*—Thirty miles from Peking, to the south-west, is situated the town of Chang-ping, an old place, and much decayed. During the Ming dynasty it was a place of importance in consequence of the Imperial tombs being in the vicinity; but the present rulers have from this very cause neglected it. It was in the prison of this city that the four English prisoners and some of the Sikh soldiers died in great torment. On the way to this place the Shaho River is crossed by a very large stone bridge, most substantially built and in good preservation. A mile from Chang-ping is the valley in which are the Shih-san-ling, or thirteen tombs of the Ming emperors. The valley is a beautiful place, and is bounded on the north by mountains; the Great Wall is distinctly seen surmounting some parts. The road as it enters the valley is crossed by a magnificent white marble gateway of five arches or divisions, which is a very striking object. The road then passes through a pavilion with an immense marble tablet, on the back of a vast tortoise, 10 feet high. The block for the tortoise is 15 feet long, 10 feet high, and 10 feet broad. The tablet records the orders of Keen-lung for the preservation and restoration of the tombs of the former dynasty, and an account of the repairs made by him in honour of the deceased emperors. The road now proceeds through an avenue formed of colossal white marble figures of men and animals. This avenue consists of sixteen pairs of animals—lions, kelins, elephants, wolves, horses, camels, &c., and twelve pairs of warriors, priests, and civil officers. These series of stone figures form a feature of the Imperial tombs, and existed in part at the old tombs near Nanking. These colossal figures are also found at the tombs of the deceased emperors of this dynasty at Si-ling, to the west, and at Tung-ling, to the east, where alternately the emperors are buried. During the building of the late Emperor Heen-fung's tomb, a road 100 miles long was made from the quarries at Fang-shan to the Tung-ling, and a block of marble 15 feet long, 12 feet high, and 12 feet broad, weighing 60 tons, was seen by several of us then resident at Peking, being dragged along this road on a strong truck or car drawn by 600 mules and horses. A large body of officers and soldiers formed part of the cortège; and surmounting the block was a tall staff carrying a large, triangular, yellow flag, having on it the characters signifying "Yield the road," or "Open the way." This block was to be cut

into the figure of an elephant, to be placed as one of the guardians of the tomb.

Proceeding into the valley by the broad road, and across the bed of a small river, which gives evidence that some great inundation has swept through the valley and destroyed the large bridge, the tomb of Yung-lo is approached. He, as above stated, moved the court to Peking, and built the first tomb in the valley for himself. It is a very large and handsome structure: a broad incline leads to the front gate, through which the court is entered. In this are an incense-burner and a pavilion, in which is a stone tablet, capped by a horned dragon, recording edicts of Shun-che and Keen-lung regarding the honourable preservation of these memorials of the rulers of the former dynasty. To the north of this court is a terrace and a large hall for the assembly of officers at times when they came to worship the tablet to the memory of Yung-lo. This hall is 80 yards long by 40 yards broad, and the roof is supported by 60 wooden columns; the whole of these are very large; the four centre columns are 50 feet high and 12 feet in girth; they are all of teak-wood brought from Pegu, through Yunnan, and thence overland to Peking. On the north side of this hall are the shrine and tablet.

Behind the great hall is another court, having in its centre a large stone altar, on which are the usual five sacrificial vessels for the offerings. On the north of the court is a lofty tower, on a terrace; in the centre of this, on the basement, is an arched tunnel rising at a gentle incline to the north end, and terminating at a bricked-up treble arch, which was the entrance to the tomb in the mound beyond. The passage or tunnel now branches off on either hand, and finally leads to the top of the terrace on which the tower stands. From the terrace arches spring up, crossed by other arches, over which is the roof; thus a central hall is made in the very solid structure; and in the centre of this stands a great marble tablet on its tortoise, all stained of a red colour, recording that this is the "Ling or resting-place of Ching-tsoo-wan-hwang ti" (Yung-lo). From the galleries of the terrace are beautiful views of the valley, of some of the tombs, and, through breaks in the hills, of the valleys beyond, and of the mountains. From the corners of the terrace, on the north side, starts a substantial but lofty circular wall with a broad roof on the top of it. This wall is a mile long, and encloses the great mound, in the centre of which is the stone tomb containing the coffin of the Emperor; this is covered over with earth, and oaks and pines grow over the whole surface.

This is certainly a great tomb, and must have cost a prodigious sum of money. In the valley are nine other tombs, one of which is that of Wan-leih, who was on the throne when Ricci came to

China, and in the smaller valleys branching from the large valley there are four more tombs. These tombs are, none of them, so large or important as the one described, and gradually decline in size as the dynasty decayed, and the rulers had less money to spend on the place of sepulture.

Ten miles from Chang-ping is the village of Nankau, the southern entrance to the pass through the wall. This place is just outside the small fortifications that guard the opening of the pass. The village consists chiefly of inns and stables for the accommodation of the numerous travellers constantly passing to and fro. Proceeding through the gates of the pass, the valley is seen extending in front. For a short distance there is a road, but very soon this ceases to exist, and the only path is the bed of the stream, that flows through the valley, and is one of the branches of the Sha-ho. The mountains of carboniferous limestone rise abruptly on either side, and now and then glimpses are seen of the wall. The river-bed road becomes full of boulders, as if they had been strewed over the place, so that it is very difficult to ride along. After riding about five or six miles, we came to Kiu-yung-kwan, a fortified station in the valley. To this point the wall is seen converging from the neighbouring hills on both sides, forming as it were a doubling in of the Great Wall itself. This is, in fact, the central point for defence in this, the most important pass through the mountains, and these duplications of the wall show the care that was taken of this particular spot. The fort is on the road, having gates at either end, and in the centre is the remarkable marble monument, built as an archway over the road, with a handsome terrace at the top.

The archway is about 40 feet long: part of the flat space of the interior on both sides is covered with large images of Buddha, elaborately carved, the remainder, about 20 feet, is occupied by a long inscription, being an invocation to Buddha in the Chinese, Niuchih, Sanscrit, and Ouigour and Baspa Mongol languages, which is of especial interest, as being one of the few inscriptions extant of the now totally defunct Niuchih language. The whole of this archway is lined with marble, the roof and all the vacant spaces are covered with innumerable small figures of Buddha carved in the stone. This monument was in great part built by the Mongols, but was finished by the Mings. At this place fierce battles were fought between the Mongols under Gengis Khan and the Niuchihs of the Kin dynasty in 1212 A.D. Many conflicts took place here and in the loop between the walls at Seuon-hwa-fu or Tatung. Gengis Khan did not succeed,—being wounded, he retired; but his son, Kublai Khan,—being called upon by the last emperor of the Sung dynasty to help him against the Kins,—finally took possession of the country for himself, and established in 1280

A.D. the Yuen or Mongol dynasty. During the whole of this period, this neighbourhood was the scene of frequent battles, and it was a most important military post; and in consequence the Mongols built this monument as a memorial of gratitude to Buddha for their victories.

After passing Kiu-yung-kwan the road becomes worse and worse; the small river has to be crossed and re-crossed, and after proceeding about a mile the hills come sheer down to the river, which passes between perpendicular walls of granite. At this place are some temples, approached by steps cut in the face of the rock, and several shrines are cut in the rocks around. Further on the road leaves the river, but is not improved in any way; the whole road is, indeed, the worst I ever travelled over, and renders travelling difficult and slow. The pass altogether from Nankau to the gate in the Great Wall, called the "Pass of the Northern Barrier," is about 15 miles. The part of the wall at which we had arrived is the large wall built A.D. 400, across the province of Chili, and is an offshoot of the older wall built B.C. 240, between China and Mongolia. From the gateway the wall goes over the hills and across the valleys right and left, and can be seen stretching away in all directions, doubling on itself, and extending over the tops of distant mountains. The wall is not quite so large as the walls of Peking, being about 30 feet high, and 20 feet at the bottom, narrowing at the top to about 15 feet. Much of the wall is faced with granite, other parts are of brick. The centre consists of earth and stones, the walls being retaining walls for the central mass of earth, as is the case in the walls of Peking. At short intervals on the wall are square towers, used as forts, in which I saw great numbers of wall pieces.

In former times, and more especially in times of political disturbance, garrisons were placed on the wall, but at present there are no soldiers in charge of it. When this Great Wall was built it was of great importance, and kept out of China the hordes or tribes of Tartars, and immense trouble and expense were incurred in building and maintaining a structure which is 1500 miles long; but since the Tartars have sat on the throne of China, the wall has fallen into decay. This inner wall which I saw is in better preservation than the older one; part of Chili and Shansi are between it and the outer one; it was erected as an additional means of support. Standing on the wall, I looked over Cha-tau, (the village near the gate,) across the plain, and saw the mountains which divide China from Mongolia. Here and there the towers of the outer wall could be seen on the hill-tops. The whole wall is a wonderful work, and much surpassed my expectations of it. The village of Cha-tau is a place full of inns, where the numerous travellers stop on their way into China. This is the chief pass, and

the one most used; and, to show how great is the traffic, it may be stated that there was a road, formerly made by the early builders, which has long since been much destroyed by floods; but the blocks of granite composing the road have ruts worn in them by the passage of narrow-wheeled carts to the depth of 6 or 8 inches. This pass is also the high road from Peking to Kiachta, and forms part of the road by which the Russians wish to bring the telegraph wires. But the Chinese Government refuse consent to this scheme, as they do also to that of railways, in their territory; for they know that where there are stations Europeans also will be placed in charge of them, and to this they will not agree on any account.

On one occasion I had to take a journey towards the east end of the Great Wall, and found at the foot of the mountains small walled cities, like castles, placed at intervals of every four miles. These were garrison towns, and were in former times part of the military supports of the defenders of the wall, and the places where the commanders of the forces resided; connection was thus kept up from place to place inside the wall itself.

There are several large Mohammedan mosques in Peking and its vicinity. Some of these buildings are old and dilapidated, others are in good repair and in flourishing condition. These mosques are for the worship of the large body of Mohammedans who live in Peking; the original families of these people came chiefly from the western and north-western parts of outer China. They live here quietly and securely under the Chinese Government, which does not in any way interfere with their religious observance or principles. Mohammedan officers are not required to attend the semi-political worship in the heathen temples, but they kneel in the presence of the emperor, and on a table in the entrance of the mosques there stands the emperor's tablet (wishing him long life), before it are placed the usual five sacrificial vessels. This table is not in the chief place of honour, but just within the outer door. Many inscriptions, both in Chinese and Arabic, decorate the walls and pillars, but no picture or idol is anywhere seen.

Outside the west gate there is a very large Mohammedan cemetery, where many thousands of these people have been buried. The tombs are more like the European than the Chinese fashion, and the inscriptions are usually in Arabic, Persian, or Chinese. These Mohammedans frequently visited me, and said they were not idolators, but worshipped the true God (whom they call Teen) as we did, and seemed to feel more sympathy with us than with the Chinese.

Shortly before my arrival in Peking the Emperor, Heen-fung, died at Jehol. It was on the occasion of the removal of his body to Peking that the *coup-d'état* in November, 1861, took place. Su-shun, the chief of the regency (of whose execution I have

already spoken), and the other members of the regency, were together in strength at Jehol, and the Empress-dowager's party did not feel strong enough to deal with them while united. They had made themselves odious to the general government and to the empress by many unconstitutional acts, and it was determined to set them all aside. Court etiquette required that Su-shun, as chief of the regency, should accompany the coffin of his master to the capital, and, as a mourner, he must be unattended by his own adherents. Thus when he came to the palace in Peking, and had concluded his service to the late emperor, he was seized and lodged in prison. In the meanwhile the other members of the regency were captured at their private houses, and the whole speedily brought to trial, convicted of treason, and condemned. Su-shun was sent to the Cabbage-market, the Princes of Muh and I allowed to commit suicide, and the rest banished to Ili. The Empress-dowager and Prince Kung, brother of the late Emperor, were then the guardians of the boy-emperor Tung-che.

As preparatory to the funeral ceremonies of the Emperor, a large bier, carried by eighty or a hundred bearers, and supporting a large and heavy wooden box, was carried about the streets, the object being to accustom the bearers to carry the coffin in thoroughly true time. In the box were seated eight or ten officers, and in the centre was placed a bowl of water; so that they could ascertain exactly whether the bier was evenly carried. This exercise was kept up for many days, and the whole of the bearers and their reliefs, probably about a thousand in number, carefully drilled.

During the time that the coffin lay in one of the Imperial temples in the Palace Gardens, the Empress-dowager went occasionally with the ladies of the court to burn incense before it. This temple was approached by a road outside the palace grounds, and one morning, very early, as I was riding along this road, I unexpectedly came on this cortège. The empress had just gone into the temple, and all the carriages were waiting outside, about ten or twelve in number; as I approached them the drivers raised the screens in front of some of the carriages, and evidently said something to the occupants, on which the screens were thrown up, and all the ladies, probably twenty or thirty, came on to the front shafts to see the foreigner who was passing. This gave me an opportunity of seeing these court ladies and their attendants for a minute or two; they were all very well dressed, and some of them very pretty women; it struck me during this hurried inspection that about half of them were Tartars, and the rest Chinese. I rode slowly past, as I did not consider that it would be polite or proper to stop, lest the officers in attendance should say I was a rude barbarian.

On the morning of the day on which the removal of the coffin from Peking to the Eastern tombs took place, the traffic through many of the streets was stopped, and the eastern gates closed for ordinary passengers. Foreigners were desired not to go into the eastern part of the city at all; but that we might not altogether lose the sight of the Imperial funeral, some of us rode a long distance outside the city, and then went to the road by which we knew the procession would pass. After a short time a body of cavalry and infantry approached, filling the centre of the broad road on either side; lining the road, were long rows of men carrying flags, like Venetian standards; then came the bier, supported on large poles varnished red; on this was the coffin covered by a large richly embroidered yellow satin pall. This was carried by eighty bearers, preceded by their chief, beating time with two pieces of hard wood; then came more cavalry and more flags, followed by the coffins of a wife of the late emperor, and a widow of the former emperor Tau-Kwang, who had died during the late reign, and who, according to etiquette, could not be buried till the occasion of an Imperial funeral. These were also covered by yellow satin palls, and carried by sixty bearers. After these came two or three of the yellow satin covered Imperial carriages. Many flag-bearers surrounded this part of the procession. After the carriages followed many carriages of the various princes, with cavalry, flags, &c., and finally a long string of the carriages of the high officers of state. The procession was about a mile and a half long; it had been much longer when leaving the city, because the young emperor and his suite had accompanied the coffin for a short distance outside the gates. At a certain temple on the road he made his obeisance towards the coffin, and returned to the palace. Very few of the citizens came out to see the funeral, and they appeared to care very little for what was going on. The procession was certainly of a very mixed character: the satin-covered coffins, &c., forming the central part of the cortège were handsome, and it was interesting to see so much of the cavalry; but the standard-bearers, and attendants, were very ragged and poor looking, and their appearance detracted much from the dignity of the ceremony.

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YARKUND?

The road runs from the East  
 North or West  
 The road runs from the East  
 North or West  
 The road runs from the East  
 North or West

Summer Route

from

## LEH (LADAK) TO THE CITY OF YARKUND

from Leh to the Karakoram Pass, compiled  
 from the records of the Survey of India  
 from the Karakoram to Yarkund from the  
 Journal of the Monarch Mahamud Hamud

Capt T G. Montgomerie R E

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English Miles

Geographical Miles

IX.—*On the Geographical Position of Yarkund, and some other places in Central Asia.* By CAPTAIN T. G. MONTGOMERIE, R.E.,  
Astronomical Assistant Great Trigonometrical Survey of India.

*Read, May 14, 1866.*

WHILST carrying on the survey of Jamoo, Kashmir, Little Tibet, and Ladak, I have always kept in view the possibility of making a reconnaissance of the countries lying to the north of the Mustak and Karakoram ranges, and to the east of Ladak, that is, of Eastern Turkistan, Yarkund, &c.

When the survey was carried up to the frontier every endeavour was made to sketch as much of the country beyond as could be done, without actually involving the surveyors with the wild tribes of Turkistan.

In this way the country was surveyed for several marches beyond the Karakoram Pass, and a rough reconnaissance was made of the Suget Valley, between the Karakoram and the mountains above Khotan. Again, to the east of the Chang-Chenmo a portion of the country was sketched, and along the great Pang-kong Lake the reconnaissance was carried about 10 marches east of the frontier. Subsequently, during this last summer, some part of Khotan has been explored by Mr. Johnson, and another branch of the Pangkong Lake has been discovered by Mr. Low. As the latter portion of the country is very sparsely inhabited, and the people met with are not very troublesome, it is possible that a well provisioned party might advance still further. On the Yarkund road, however, it was evident that any further advance would have brought the surveyors within the range of the Khirgiz hordes who infest that road.

As any political complication, such as might be caused by the capture or murder of a surveyor had to be avoided, it was clear nothing more could be done in that direction by the regular survey operations. But while I was in Ladak I noticed that natives of India passed freely backwards and forwards between Ladak and Yarkund, and it consequently occurred to me that it might be possible to make the exploration by their means. If a sharp enough man could be found he would have no difficulty in carrying a few small instruments amongst his merchandize, and with their aid I thought good service might be rendered to geography. Accordingly I addressed the Bengal Asiatic Society with reference to this plan in a letter, extracts of which accompany this paper, *vide* Appendix A.

My proposal received the support of the Asiatic Society, and the Government of India ultimately decided to carry it out. There was some delay in getting the necessary sanction, but in the mean

time Sir Robert Montgomery, the Lieutenant-Governor of the Punjab, took up the proposal most warmly, and said the Punjab Government would pay the expenses of an experimental expedition.

I recommended Yarkund as a suitable goal for the first attempt. Our knowledge of that city being particularly vague, and as it was also known to be comparatively close to our own frontier, only some 15 marches beyond, I thought it more especially adapted to our purpose.

The inhabitants of Yarkund were known to be chiefly Mahomedan, it was therefore necessary to select a Mahomedan for the work. A moonshee called Mahomed-i-Hameed offered his services for the work. He had been employed some years in the north of India and latterly in the Punjab; he was acquainted with the rudiments of route-surveying, and could use a prismatic compass and read a vernier.

Sir R. Forsyth, Secretary of the Punjab Government, assisted me in every way, and all arrangements were made during May, 1863. The moonshee Hameed joined my camp in Kashmir; he was instructed in the method of taking latitudes with a pocket sextant and also in recording the temperature of air and boiling water. As soon as he had acquired tolerable proficiency he was despatched from Kashmir to Leh, the capital of Ladak. The time for training was very short, as it was decided to send Hameed into Yarkund during the summer of 1863, so that he might be able to return early in 1864.

The moonshee left Kashmir on the 12th June, 1863, with a detachment of the Great Trigonometrical Survey which was going in that direction. He reached Leh, the capital of Ladak, on the 4th July. Having made a rough route-survey from Kashmir to Leh, I was able to test his work, as that route had already been regularly surveyed. The results proving satisfactory, the moonshee was directed to proceed from Leh to Yarkund, and to make a similar route-survey along that road.

The following equipment of instruments was given to him, viz:—

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| 1 Pocket sextant  | } All of the smallest size procurable. |
| 1 Dark glass artificial horizon                           |  |
| 1 Prismatic compass                                       |  |
| 1 Pocket compass  |  |
| 2 Thermometers  |  |
| 2 Plain silver watches.                                   |  |
| 1 Copper jug and oil lamp for boiling the thermometers.   |  |
| 1 Small tin lantern for reading off the sextant at night. |  |
| 2 Books for recording; spare paper, &c. &c.               |  |

Every endeavour was made to prevent the instruments from being conspicuous; the stand of the prismatic compass was not sent, but in its place the moonshee was provided with an ordinary

spiked staff, such as Himalyan travellers generally carry. The head of the staff was made rather larger than usual and cut off flat so that the compass could be rested on the top. By this means a steady observation could be readily secured without much trouble and in a way little likely to excite suspicion.

The moonshee was detained at Leh some time before satisfactory arrangements could be made to send him on: he accordingly arranged to join some Ladak and other merchants who were at that time forming a *kafila* or caravan for Yarkund. He hired two servants, viz. Yusuf and Kasim Ali, bought a pony and some ordinary merchandise; he also took with him a letter of credit on Yarkund and a small supply of money.

The *kafila* left Leh on the 23rd August, 1863, and the moonshee Hameed followed the next day. The *kafilabashi*, or head man of the caravan, decided to take the ordinary summer route from Ladak to Yarkund. Their journey commenced at Leh, 11,278 feet above the sea. The moonshee found the temperature of the air 42° at noon, and water boiled at 181° 3" of Fahrenheit. From the Karakoram the *kafila* descended again into Turkistan, and on the 13th September reached Suget on the Karakash River. Following the Karakash for a short way the moonshee again ascended a great northern spur of the Karakoram Mountains, and crossing over it on the 17th, emerged from the mountains on the 20th September. From that time they marched over almost level ground through villages and cultivation, finally reaching the city of Yarkund on Wednesday the 30th September, 1863. The moonshee's last remark being that the country of Yarkund is most fruitful and boasts of many vineyards.

The moonshee left on the 23rd August, and, after 30 days' hard marches over the most elevated country in the world, reached Yarkund on the 30th September. The first day the *kafila* halted near a Buddhist monastery at a village a very short distance from Leh. On the second day they halted at Sipol, which is a barren waste, having no sign of human habitation, and boasting only of a Buddhist shrine (*Choortan*). The moonshee, who caught up the *kafila* or caravan at this place, remarks that here all travellers are seized with a bad headache, owing, no doubt, to the great elevation, as the moonshee says he found a great quantity of snow on the ground on the 24th August. The third day they crossed a very high pass, but halted at a village where barley and mustard thrive capitally, though it was too cold for wheat, &c. During the night the surrounding hills had the benefit of a heavy fall of snow.

The fourth day the *kafila* halted at the village of Kardoan, which boasts of orchards of apples, apricots, and walnuts. The fifth day they halted at the village of Diskit, about 9000 feet above the sea, a large village on the Shayok River. Here the

moonshee says wheat was scarce, but there was plenty of barley and mustard.

The sixth march the *kafila* crossed the Shayok River, and ascended the Nubra valley, halting at a small village, and the seventh march brought them to Panamikh. This is the last village, and also the last place where good grass is obtainable on the Ladak side of the Karakoram Pass. Travellers generally halt for a few days, so as to rest their cattle and give them a good feed before crossing. The *kafila* therefore halted two or three days, and started from Panamikh on the 1st September.

During the next 19 days they passed over very lofty desolate mountains, and never saw either a village or cultivation during the whole of that time. On the nineteenth day they reached Kilyan, the first village of Yarkund.

These nineteen days were the most trying of the journey. No grass could be got for the cattle during twelve days till they reached Suget, on the Karakash River. The *kafila* had on this account to take a large supply of grain with it, and only a very small quantity daily could be doled out to the ponies. Numbers of ponies died in consequence.

From Kilyan the moonshee made his way to Yarkund with the *kafila* in five more marches, halting each day at some village. He was much struck with the fertility of the country, and after crossing such difficult and desolate mountains very probably thought it much better than it was in reality. On reaching Yarkund the moonshee seems to have had no difficulty in making friends. Though the province is ruled by a Chinese official and the city garrisoned by Chinese troops, the mass of the population is Mahomedan, and ruled in ordinary matters by their own governor, subordinate to the Chinese. The Mahomedan governor at that time was half a Kashmirian by blood, but had never been out of Yarkund. The moonshee ultimately became a great friend of this governor, but how he succeeded in becoming so is not known for certain; it was most probably through an old friend of his own, called Awaz Ali, whom he found settled in Yarkund. By the assistance of Awaz Ali the moonshee seems to have been housed without any difficulty, for it appears he was able to take star observations on the third night after his arrival in Yarkund; and as he could have done this only in a private place, where no stranger could see him, most probably it was from the roof of his friend's house.

The moonshee settled down in Yarkund for the winter, and remained there and in its vicinity during the whole of October, November, December, January, February, and nearly the whole of March; his last observation taken in Yarkund being dated the 27th March, 1864. The winter in Yarkund seems to have been

very severe: the thermometer early in January having fallen nearly to zero, or  $32^{\circ}$  below the freezing-point. At times the weather was cloudy, and from the 19th to the 26th January snow fell; but, judging from the general regularity of the observations of the sun and various stars, the atmosphere on the whole must have been very clear. Beyond the 27th March no record is forthcoming, but it was afterwards ascertained that the moonshee had in some way excited the suspicion of the Chinese officials, or some one had drawn their attention to the moonshee. At any rate, the Mahomedan governor told the moonshee that the Chinese were making inquiries about him, and that he had better not remain in Yarkund any longer. He advised him to send off his property at once, and to follow it himself before a fortnight was over, otherwise he would most probably get into trouble. Following this friendly advice, the moonshee despatched his servants and property with a *kafila* just starting for Leh, and he himself overtook them at the Suget grazing-ground, where they had promised to wait for him. The moonshee's friend or relation, Awaz Ali, accompanied him, and they went on with the *kafila* and recrossed the Karakoram Mountains in safety. After crossing the pass, the moonshee and his friend, Awaz Ali, both became ill and got very weak, and ultimately they both died, within two or three days of each other, when only at a short distance from Ladak. The *kafila* had at that time reached British protected territory, and happened to be quite close to an encampment of the Great Trigonometrical Survey under Mr. Johnson. Mr. Johnson heard of the death of the moonshee, and at once proceeded to inquire into the matter. The men with the *Kafila* said the moonshee and his friend died from eating wild rhubarb, which in April and May is abundant; but Mr. Johnson thought there was good cause to doubt this statement, and, accordingly, he took possession of such of the moonshee's property and papers as he could get hold of, and sent the whole to the British officer then on political duty in Kashmir. This officer inquired into the matter, examined the moonshee's two servants and others, and finally came to the decision that there was nothing beyond a case of suspicion.

The death of the poor moonshee was most unfortunate, after he had passed safely through the real dangers of the expedition, viz., those incidental to travelling in Turkistan and to a residence in a semi-barbarous place like Yarkund, where the mere fact of possessing instruments and taking notes was likely to get a man into trouble. If the moonshee had been killed by the robbers that infest the Yarkund road, or had been imprisoned or put out of the way by the Chinese officials, it would not have been very surprising.

The best-armed *kafilas* passing through Turkistan are some-  
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times robbed by the Kirghis hordes, and those who resist are generally killed: and in Yarkund the Chinese are, to say the least, very arbitrary in their dealings with strangers. The poor moon-lee got safely through all these dangers and died, after he had left Turkistan, either from natural causes or in a way that might have happened to a native in the most civilised parts of the British territory.

The moonshee's watch, instruments, papers, and manuscript books do not seem to have been touched, though his fellow-travellers appropriated some of his more saleable property; but this they would most probably have done whether his death was natural or otherwise. Though the moonshee's papers, &c., were untouched still the value of the work is much diminished by the want of those explanations which can be obtained only from the recorder, and no doubt a great deal of unrecorded information is altogether lost.

Owing to the examination regarding the moonshee's death and other causes his books and papers reached me only at the beginning of 1865, just as I was leaving India for England.

The instruments were all in good order, except the smaller thermometer, which was unfortunately broken after despatch from Lahore. The books consisted of one volume of *Astronomical Observations*, in English; one volume of a *Magnetic Route-Survey*, in English; one volume *Vernacular Journal*; one volume of *Observations and Route-Survey*, in vernacular (Persian character); some miscellaneous papers, and a plan of the position of the various towns in Eastern Turkistan.

The above are all in my possession, except a paper or papers containing an account of Yarkund, and of the Chinese administration, and the state of parties in Eastern Turkistan, which is in the hands of the Punjab Government.

The General map found among the moonshee's papers is a very interesting one; it gives the position of all the chief places in Eastern Turkistan, and it also shows what the moonshee's views were as to the countries west and north. The progress of Russia in the Ilekh valley seems to be correctly noted; but whether he is right in saying that the Russians have a fort near Lake Lop, and mean to build others in Eastern Turkistan, is very doubtful.

The moonshee gives the position of Shukhargāu, which he says was the capital of Afrāsiāb, a real or fabulous conqueror of Persia, much celebrated in Persian poetry, said to have lived seven centuries before the Christian era. The town of Sirikul is said to have been the capital of the son of Afrāsiāb; but as Afrāsiāb is supposed to have been a sort of family surname, like the Pharaohs, Ptolemies, or Cæsars, there is no saying whether the son of the conqueror of Persia is referred to, or only one of his descendants.



From the books, &c., it appears that the moon-shee made a complete route-survey from Leh to Yarkund. As he was marching with a *kafila*, all measurements of the road with a chain would have been quite out of the question, even if the nature of the country permitted of it; but in such mountains it was physically impossible. I therefore desired he should simply record the bearing and direction of the road as far as he could see along it at one time, and with his watch note the time he marched in that direction. By this means I trusted that a very fair route-survey might be obtained, if the value or rate per hour could be satisfactorily established. This rate I was able to determine from the average of his marches before and after reaching Leh. On leaving Kashmir the moonshee, with the above object in view, was made to record the direction and time between Kashmir and Leh. And again, beyond Leh, the regular survey had been carried three marches down the Turkistan side of the Karakoram Pass. The latter enabled me to follow the moonshee's work for 18 out of the 30 marches; and by this means it was easy to form an opinion on the amount of reliance that ought to be placed on his route-survey of the other 12 marches.

The observations for latitude formed a further very valuable check, and prevented any great accumulation of error. A great number of observations were taken at Yarkund, and by combining the route-survey with the latitude, I think it may be concluded that the latitude and longitude of Yarkund have been determined within narrow limits.

The bearings or azimuths for the route-survey were taken with a good prismatic compass; and the moonshee was capable of observing as accurately as the instrument permitted.

The latitudes were taken with a very small pocket box-sextant without a telescope, and consequently observations of stars (and more especially of such a small one as the pole-star) could not be made very accurately. The sextant could be read to half a minute, but the observations, owing to the above want, do not in any way approach that degree of accuracy. The great number of observations, taken at Yarkund, is, however, some compensation. The mean of eleven days' observations, in October, November, December, 1863, gives a latitude of  $38^{\circ} 20'$  for Yarkund. And, as a general rule, the latitude deduced on any one day does not differ from that determined on any other more than  $12'$ , so that I conclude  $38^{\circ} 20'$  to be a very fair approximation to the latitude.

The observations of the temperature of the air and boiling water give a fair idea of the climate, and also determine pretty closely the height of Yarkund above the sea. The height was a very great desideratum, as hitherto there was nothing beyond the

vaguest speculation as to how much Yarkund is above the sea. The known products of the country, viz., silk, cotton, rice, grapes, &c., enabled geographers, with the aid of the supposed latitude, to make a guess at the height; but in no other way could any approximation be arrived at. By some it was supposed to be 2000 feet above the sea, and by others as much as 5000. The observations of the boiling-point give a mean height of about 4000 feet, which is perhaps within a few hundred feet of the truth. Certain products are known to grow at nearly the same height at a similar latitude in the Himalayas; but the climate of China and Central Asia are known to be so very different from that of Hindustan, that geographers naturally felt very doubtful about any such deductions.

From the above it will be seen that the latitude and height of Yarkund (lat.  $38^{\circ} 20'$ , height 4000 feet) had been fairly determined by actual observation, while the remaining element of geographical position, viz., the longitude (long.  $77^{\circ} 30'$ ), can be pretty closely deduced from the route-survey, and more especially as its general direction was nearly meridional. And these were the main geographical objects of the expedition. The river of Yarkund flows rapidly past the town, and goes to the east of Aksu \* for 18 or more marches—say 200 miles; and I do not think it is too much to assume that in that distance it must fall at least 1500 feet; and I conclude that most probably any surplus water of the Yarkund River falls into an inland lake, or is swallowed up by sand at an elevation of little over 2000 feet above the sea, some 28 marches beyond Yarkund. The lake or desert in which the Yarkund River is lost has been generally marked on the maps as Lob-nor Lake, in the great desert (or Gobi). This forms an extraordinary basin or depression in the heart of Asia, surrounded by mountains with no gap or pass of a less elevation than 13,000 feet on the north, of 18,000 on the south, of perhaps 10,000 on the west, and 10,000 on the east.

Whilst at Yarkund the moonshee sent his friend Awaz Ali to Kokan, and intended to have followed himself, but the suspicions of the Chinese authorities having been aroused he was unable to do so. From Yarkund he was, however, able to get bearings of all the principal towns of Eastern Turkistan, from which he made a rough map of the country.

The towns, the bearings of which are likely to be most accurate, are Kashgar, Khotan, and Sirikul, as shown in the moonshee's map; but I do not think much reliance can be placed on the others.

Khotan, which is only 8 or 9 marches east of Yarkund, is the

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\* Aksu is on a river that joins the Yarkund River.

name of a province which was formerly said to contain seven large towns, but the sand of the Great Desert seems to have encroached on them, and only three towns of any great size remain. Khotan, the old capital of the province, was long ago swallowed up by the sand. Its site was not many miles from Ilchi, the modern capital.

The inhabitants of Ilchi say that within the last few years, when the wind blows hard, some of the old houses of Khotan have been laid bare, and they often succeed in digging out various articles that have been buried. From this it would appear as if the city had been buried suddenly before the inhabitants had time to remove their property, but however that may be, the town no longer exists.

About 10 miles to the west of Ilchi is the town of Karakash, on a large river of the same name, which flows within a few miles of Ilchi. From the bed of the Karakash River the greater part of the Chinese jade-stone is procured. This jade-stone, of which there was such large quantities in Calcutta, after the last Chinese expedition, is called yeshm in the Persian and sootash in the Turki language. I saw several pieces of it that had been brought from Barakach, cut into buckles, &c., and I have no doubt of its being the same as that brought from China. The Nukshibunné Synd, a resident of Kashmir, who had been to Ilchi, told me that the Khan's (*i. e.*, the Emperor of China) palace was built or lined with it. In the route-survey it is noted that the Karakash River joins the Suget River, not far below Suget itself, and that there is a jade-quarry (Kan-Sang), about 26 miles distant from the junction, and near the Karakash River, and I suppose that the jade is procured from this and perhaps other quarries, as well as from the bed of the Karakash River.

Kashgar is the most easterly town under Chinese authority, it is supposed to stand higher than Yarkund.

The direction of Aksu, derived from the moonshee's map, agrees tolerably with that given in the map accompanying Semenov's paper in the Geographical Society's 'Journal,' and consequently accounts pretty well for all the unknown ground between the work of the survey of India and the explorations of Semenov.

On the whole I think it may be concluded that the results are satisfactory, and had the poor moonshee not died after completing his work, nothing more could have been expected from a first attempt. I think he was an honest and patient observer, and had he lived his exertions would, I am sure, have been handsomely rewarded by the Punjab Government.

Two Bhotiyas of Milum, from the British Hill district of Kumaon have been carefully trained, and just before leaving India I started them on an expedition to Lassa. These men being natives of Tibet ought to have no difficulty in making their way, and as

they are very intelligent and well trained, I hope hereafter to be able to send the Geographical Society some valuable results. Should this last expedition prove successful, various other explorations will be made in the same manner.

The moonshee's route enables me to give you some idea as to the enormous width of the Himalayan Range. For after marching about fifty-one days across the mountains, he only reached the watershed dividing Hindostan from Turkistan, and after 15 marches more, or in all after 66 marches, he reached Yarkund, on the opposite slope, and even then was 4000 feet above the sea.

From Jummoo (or any point in the Punjab at the foot of the Himalayas), it takes a man, assisted by a pony, sixty-six days to cross the mountains; and I think that even if a man tried his utmost he could not well do it much under fifty-five days; during that distance the road is, for 25 marches, never under an elevation of 15,000 feet, and during 45 marches never descends below 9000 feet.

Direct, that is as the crow flies, the distance from Jummoo or Hushiapore to Yarkund is 430 miles. So that the mountains may be said to be at least 400 miles across their smallest breadth.

The Alps, I suppose, would take at the outside three days for a man to cross, and I believe that a good walker can cross from a village on one side to a village on the other in one summer's day. The moonshee took twenty-five days to march from the last village south of the Karakoram to the first village of Yarkund, north of the Karakoram.

## APPENDICES.

### (A.)

Extract from CAPTAIN T. G. MONTGOMERIE's Letter to the Secretary of the Bengal Asiatic Society.

"Camp Ladak, 21st July, 1862.

"SIR,—I have now the honour to address you with reference to my proposal for employing natives in the exploration of countries which are not as yet accessible to Europeans.

"I think that for Central Asia, Mahomedans from our North-Western frontier are most likely to supply the best recruits; for other countries, Great Tibet, &c., it may, from time to time, be found expedient to train a different class.

"The observations to be made by such natives should be as simple as possible. The instrumental equipment should be compact.

"I should propose the following as the primary objects of their explorations; 1st, the latitude of important points; 2nd, the heights of ditto; and 3rd, a rough survey from point to point; 4th, an account of each march and of each remarkable place visited.

"From the conjoint observations of the compass and watch, for the direc-

tion and the time occupied on each march, I should hope that we would also get a fair approximation to the longitude of the various places.

"I think the following instruments would be sufficient, viz. :—

"One small sextant and artificial horizon.

"Two small thermometers to record the temperature of air and of boiling water.

"Two good silver watches, &c.

"The above skilfully used and the results honestly recorded, would at any rate give us an intelligible idea as to the whole of Eastern Turkistan.

"At present we are in great doubt as to what really is the position of the various cities and places in that portion of Central Asia.

\* \* \* \* \*

"After Eastern Turkistan, I should recommend exploration to the east of the Pangkong Lake district, then in the Lassa direction and so on; but in each case I should recommend the explorers to accompany men who have been in the habit of visiting the countries in question."

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### (B.)

With reference to the route-survey and the latitude observations, my opinion is that, as far as they go, they are thoroughly trustworthy. The moonshee did not understand even the meaning of latitude, he knew the Pole Star, and thought he knew several other stars; but as far as I can make out he applied the Arabic names to the wrong stars. On the road between Kashmir and Leh, he was quite distressed to find the altitude of the Pole Star vary, and I feel quite certain he could never have had any idea of making up his observations, for he was quite incapable of working out a latitude from the sun or any southerly star, and indeed I doubt if he had any notion of getting it even from observations to the Pole Star.

With reference to his route-survey, he had no possible means of access to the survey of the first 15 marches, and indeed at the time he started, 5 of those marches had not been surveyed, and as the moonshee's survey of the first 15 agrees very fairly with those of the survey, I think similar credit can be given to the remaining 15.

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### (C.)

LATITUDES deduced from Star Observations taken at YARKUND, with a small pocket sextant without a telescope.

On the 20th October, 1863	..	..	..	..	S. lat.	38	24	44
" 21st "	..	..	..	..	"	38	17	2
" 22nd "	..	..	..	..	"	38	21	43
" 12th November	..	..	..	..	"	38	16	0
" 16th "	..	..	..	..	"	38	27	15
" 17th "	..	..	..	..	"	38	7	35
" 18th "	..	..	..	..	"	38	5	55
" 5th December	..	..	..	..	"	38	29	1
" 15th "	..	..	..	..	"	38	22	19
" 17th "	..	..	..	..	"	38	23	0
" 18th "	..	..	..	..	"	38	22	59

Mean latitude of Yarkund .. .. 38 19 46

NOTE.—On each of the above days the latitude given is from the mean of

deductions from North to South Stars, so that index error is eliminated. The index error was taken, but the above method was considered to be the most satisfactory.

## (D.)

## COMPARISON OF THE OLD AND NEW POSITIONS OF PLACES IN EASTERN TURKISTAN.

Hitherto the positions of all places in the interior of the Chinese Empire have been derived from the Survey made by the French Jesuit Missionaries or their pupils, more than 100 years ago.

As far as modern experience in China Proper extends, there is every reason for confidence in the work of the learned fathers; but with reference to the latitude and position of places in frontier provinces, such as Eastern Turkistan, &c., there has hitherto been no means of testing their accuracy, and at the same time it was doubtful whether the positions were all determined with the same regularity as those of places in China Proper.

It seemed to be very unsatisfactory that the geography of that part of Central Asia should depend upon observations taken so long ago, and which had never been tested.

I consequently tried to fix the position of places in Eastern Turkistan from known points to the south of the Karakoram, and solely from modern information collected in British India.

In a memorandum written several years ago, I in the above way deduced the position of Yarkund,\* and came to the conclusion that its latitude was somewhat to the south, and its longitude considerably to the east of the values given by Humboldt in his '*Asie Centrale*' on the authority of the French Jesuits. I also deduced the position of Ilchi, the capital of Khotan, and came to the conclusion that it was very considerably to the west, and a good deal to the north of the Jesuits' value.

Now it is evident that my means of determining the longitude were likely to give a favourable result, my deductions being made from points very close to the meridian of both Yarkund and Ilchi, whilst the Jesuits' values were made, in connection with Peking  $30^{\circ}$  to  $40'$  to the east of those places.

It appeared to me strange that I should in the one case deduce a longitude considerably to the *East*, and in the other a longitude still more to the *West* of those given by the Jesuits. The only conclusion that I could come to was that the Jesuits' longitude of either one or the other was radically wrong.

Soon after writing the above memorandum, I obtained a copy of the geographical values assigned by the Schlagintweits to places in Eastern Turkistan.

The comparatively small differences in longitude at the Karakoram Pass and at Ilchi, contrasted with the very large differences at Yarkund and Kashgar, between the Schlagintweits' values and mine still farther excited my curiosity, and induced me to test the probability of the positions assigned to the cities of Turkistan by the Schlagintweits.

It is well known that there are but 8 marches between Ilchi and Yarkund. According to the Schlagintweits the distance between those towns is 254 miles, which would make the average direct length of each march about 32 miles, a rate quite out of the question, as it would represent at least 40 to 50 miles per day over a rough country. After analyzing several other routes, I came to the conclusion that the Schlagintweits' longitude of Ilchi was likely

\* I feel convinced that my longitude was likely to be a good approximation, because all said it lay w. of Ken and E. of Musla.

to be a good approximation, but that their values of Yarkund and all places to the north and east were not in accordance with their value of Ilchi.

The differences between the new values and those of the French Jesuits and the Schlagintweits can be readily seen in Appendix E.

## (E.)

Position of	By the French Jesuits.		By Schlagintweit.		By Capt. Montgomerie from Hameed.	
	Lat.	Long.	Lat.	Long.	Lat.	Long.
Yarkund .. ..	38 19*	76 16	38 10	74 10	38 20	77 30†
Ilchi, Khotan .. ..	35 50†	80 33	36 50	78 20	37 37	78 57
Kashgar‡ .. ..	39 25§	73 57	39 15	71 50	39 25	75 21
Sirkul town .. ..	..	..	..	..	38 10	75 39

\* Latitude of Yarkund is given in Humboldt's 'Asie Centrale,' vol. ii. 429.

† Vide *ibid.* p. 418.

‡ Kashgar and Khotan are given in the same work, vol. iii. p. 437.

§ Latitude of Kashgar from Jesuits' longitude from the Jesuits.

## (F.)

## ABSTRACT of MARCHES of MAHOMED-I-HAMEED.

The moonshee left the town of Leh, the capital of Ladak, on the 23rd August, 1863, and reached—

Number of March.		
1.	Gaulis, a village and monastery, on the .. ..	23 Aug.
2.	Supole encamping-ground, on a barren part of the mountain .. ..	} 24 "
3.	Khurdoon, village .. ..	
4.	Khulsur, village .. ..	25 "
5.	Diskit, village .. ..	26 "
6.	Chünshin, village .. ..	27 "
7.	Panamik, village .. ..	28 "
	and halting there two days, reached—	29 "
8.	Stuksha, village .. ..	1 Sept.
9.	Changhung, village .. ..	2 "
10.	Spungshear, no village .. ..	3 "
11.	Gumloo, no village .. ..	4 "
12.	Sassar, no village .. ..	5 "
13.	Khooboolaku, no village .. ..	6 "
14.	Boasa Kalan, no village .. ..	7 "
15.	Daulatooldee, no village .. ..	8 "
	and crossing the Karakoram Pass reached—	
16.	Barangsa Abdoolah, no village .. ..	9 "
17.	Malikshah, no village .. ..	10 "
18.	Bushbeer .. ..	11 "
19.	Suget .. ..	12 "
20.	Orbook .. ..	13 "
21.	Sanjoo, valley .. ..	14 "
22.	Kiliyan, valley .. ..	15 "
23.	Toogiamanluk .. ..	16 "
24.	Ungoor Agul .. ..	17 "

25. Namloang .. .. .	18 Sept.
26. Sookltash .. .. .	19 "
27. Kiliyau, village .. .. .	20 "
28. Lungar (2nd), village .. .. .	21 "
29. Boora, village .. .. .	22 "
30. Yazee, village .. .. .	23 "
31. Piorurp, village .. .. .	24 "
32. Yarkund, city .. .. .	25 "

Between the 9th and 27th camping-places there were no villages or shelter of any kind, except occasionally some dry stone walls put up by travellers to keep off the wind in very elevated places.

(G.)

ABSTRACT of the MOONSHEE MAHOMED-I-HAMEED'S ROUTE-SURVEY from the  
KARAKORAM PASS to YARKUND.

Name of Place.	Time occupied in Marching from Place to Place.	Observed Magnetic Bearings.	Remarks.
	H. M.		
Karakoram Pass .. .. .	.. .. .	.. .. .	Variation of the needle $2\frac{3}{4}$ E.
Jamaecooldee .. .. .	1 12	50 0	
Barangsa (Balti) .. .. .	2 41	346 0	
Barangsa (Abdulah Khan) .. .. .	0 29	65 0	
Kazltak .. .. .	2 0	17 30	
Chadurtash .. .. .	2 16	17 30	
Wahabjalgalah .. .. .	1 11	17 0	
Dubdasurghod .. .. .	0 24	17 0	
Nizaetash .. .. .	0 39	17 0	
Malikshah .. .. .	3 40	17 0	
Aghtak Augoor .. .. .	1 10	301 0	
* * *	1 59	301 0	
Chibrah .. .. .	2 42	301 0	
* * *	1 19	295 0	
Suget dāwān .. .. .	1 39	315 0	{ Dāwān means a mountain or pass.
Khooshjalgalah .. .. .	0 13	328 0	
Bel dāwān .. .. .	1 3	328 0	Mountain.
Bashabeer .. .. .	1 52	328 0	
Sooget .. .. .	2 30	57 30	
Belagchikulshah .. .. .	1 20	11 0	Khojah.
* * *	2 12	340 0	
Sadoola Khojah .. .. .	1 25	11 30	
Oibook .. .. .	0 18	11 30	
* * *	1 20	35 0	
Chizghanluk .. .. .	1 44	35 0	
Toogra-chu .. .. .	1 1	35 0	{ Or Toogra River coming from the village of Jularik and the Kalik Mountains.
Chaglak .. .. .	0 31	58 30	
Sanjoodara .. .. .	0 50	58 30	
* * *	0 47	328 0	Or valley, Ali-Nazr Kurghan.
Bastung .. .. .	1 32	306 0	
* * *	0 14	306 0	
* * *	1 36	323 0	
* * *	1 53	288 30	



ABSTRACT of the MOONSHEE MAHOMED-I-HAMEED'S ROUTE-SURVEY.—*continued.*

Name of Place.	Time occupied in Marching from Place to Place.		Observed Magnetic Bearings.		Remarks.
	H.	M.	°	'	
Kiliyan darra .. ..	0	52	330	0	Or Kiliyan Valley.
Changshabeer .. ..	1	17	330	0	
* * *	1	28	345	0	
Togiamanluk .. ..	2	47	345	0	
* * *	1	0	80	0	
Crest of a mountain ..	3	51	40	0	{ Usually called the Kiliyan darra, a halting-place taking its name from a large flat stone.
Chadurtash .. ..	3	49	40	0	
Choonaghil .. ..	1	0	350	0	
Ungoor aghil .. ..	1	13	350	0	
Kechakbishla .. ..	2	31	320	0	
Choongbishla .. ..	1	1	50	0	
Changshabeer .. ..	0	19	50	0	
* * *	0	43	20	0	
* * *	0	51	20	0	
Khathaitam .. ..	0	27	360	0	Khathaitam (? Chinese pillar).
* * *	0	36	360	0	
Namloang .. ..	1	0	50	0	
* * *	1	33	50	0	
Choongmalik .. ..	0	43	40	0	
Tatookiya .. ..	1	4	315	0	
Bogirakachik .. ..	1	3	315	0	
* * *	0	20	280	0	
Kodamazar .. ..	0	15	290	0	Khajum.
Bashtarum .. ..	0	16	290	0	
* * *	0	35	290	0	
Kahram Angoor .. ..	0	41	325	0	
Sookultash .. ..	0	34	325	0	{ First cultivation seen north of the Karakoram.
Akshoor .. ..	0	33	342	0	
* * *	0	32	342	0	
* * *	2	5	535	0	
Kauchoong .. ..	0	15	310	0	
Saragharok .. ..	1	58	310	0	
* * *	0	30	310	0	
* * *	0	31	15	0	{ Mountains cease north of this point.
Kiliyan .. ..	2	14	45	0	
* * *	0	35	15	0	A Yarkundie village
* * *	0	55	15	0	
Tazghoon River .. ..	0	38	350	0	Or Kiliyan River.
Sazam .. ..	0	12	350	0	
* * *	0	23	350	0	Village.
Lungur, 1st .. ..	1	49	330	0	{ Lungur means a small police or custom-house station.
Lungur, 2nd .. ..	0	41	330	0	
Hasanbayhra Village ..	1	8	310	0	{ The grave of the king's brother is here (name of king not given).
* * *	0	20	310	0	
* * *	0	47	310	0	
* * *	1	58	307	0	
* * *	1	22	335	0	

ABSTRACT of the MOONSHEE MAHOMED-I-HAMEED'S ROUTE-SURVEY.—*continued.*

Name of Place.	Time occupied in Marching from Place to Place.	Observed Magnetic Bearings.	Remarks.
	H. M.	° ' "	
Boora .. .. .	0 35	320 0	A village.
* * *	2 12	15 0	
* * *	0 50	345 0	
* * *	2 22	332 0	
Besbarik .. .. .	0 33	315 0	{ This is the name of a pergun- nah containing 25 to 30 villages.
* * *	0 38	315 0	
* * *	0 45	330 0	
Kurkalik .. .. .	1 33	310 0	{ A town or large village with a bazar.
* * *	0 28	310 0	
Charbagh .. .. .	0 57	338 0	
Kurrabagh .. .. .	0 44	307 30	
Yazee .. .. .	1 1	307 30	A village.
Kichee .. .. .	2 10	355 0	
Tograchee .. .. .	0 39	355 0	
Tawakashkabrook .. .. .	0 21	355 0	
* * *	0 17	355 0	{ North of this point the path becomes more like a road.
* * *	0 33	355 0	
Lungur, 3rd .. .. .	0 16	315 0	
Jalkajee .. .. .	0 34	315 0	
* * *	0 27	315 0	
Toghrak mazar .. .. .	0 49	350 0	
Yusra oostung .. .. .	0 11	350 0	Oostung means a canal.
Poshkum oostung .. .. .	1 39	350 0	
Poshkumbazar .. .. .	0 5	350 0	
River Boi .. .. .	1 30	350 0	{ Or Yarkund River flowing from hills on the west.
Pionup .. .. .	1 27	350 0	
A canal .. .. .	0 35	360 0	In the pergunah of Otouchee.
* * *	0 23	325 30	
Lungur chalk .. .. .	0 15	360 0	
Lungur .. .. .	0 22	360 0	
* * *	0 28	315 0	
Lungur .. .. .	0 18	355 0	
Lungur .. .. .	0 18	355 0	
* * *	0 18	355 0	
Yarkund city .. .. .	1 0	335 0	{ A rich country with many vineyards.
Total number of hours from Karakoram Pass to Yarkund .. .. .	124 30		

*Note.*—The bearings were taken with a good prismatic compass, and the time was noted by an ordinary watch.—T. G. MONTGOMERIE, Capt. R.E.

X.—*The Western Shores of Volcano Bay, Yesso.* By Commander  
C. S. FORBES, R.N., F.R.G.S.

*Read, May 14, 1866.*

ON the 30th of August, 1865, I left Hakodadi for the purpose of exploring the western shores of Volcano Bay; and also of examining the two volcanoes in that vicinity. Our expedition—consisting of three Europeans, one Chinese, and five Japanese, all well mounted—left the town early, and passing Kamida, the residence of the Governor of Yesso, skirted the coast in the direction of Cape Siwokubi. After a ride of five miles, we forded a considerable stream on the banks of which was a hot sulphurous spring, and then commenced the ascent of the high mountain-land, which extends from the interior towards Cape Yesan. The plain we had traversed was covered with rose and raspberry bushes, and the plants of the hop, pink, and strawberry were in great abundance. The numerous farms and cottages were standing amidst fields of millet and other grain, and their gardens were full of vines, peach, and pear trees.

Our route amongst the mountains was very rough, and in some of the gorges the morasses were well nigh impassible. With the exception of a few charcoal-burners' huts, there were no inhabitants in this magnificent forest-land, where the chesnut, oak, beech, and many species of pine abound in the greatest luxuriance.

On crossing the summit of the ridge, which is about 2000 feet in height, and descending towards the shore of Volcano Bay, we were obliged to dismount, as the route was very precipitous, and in many places no better than a watercourse. Passing another hot spring, at five o'clock, we arrived at Osarcibē, a fishing-village on the shore of Volcano Bay, and established ourselves at a tea-house.

*Aug. 31st.* We spent the day in endeavouring to find a route leading towards Cape Yesan, but that was impracticable, on account of the denseness of the forest; we hired a fishing-boat for the next day, the distance by water being about 12 miles.

The shores of this portion of the bay are studded with villages and hamlets, entirely inhabited by fishermen. At present gathering and drying kelp is their chief occupation. It is exported in considerable quantities to China, where it is used as an article of food; its saline qualities making it a substitute for salt, which in that country is heavily taxed. There is every evidence of abundance of fish of all descriptions, large quantities being used in the manufacture of oil. The fishermen are a vigorous and industrious race, and manage their unmanageable-looking boats with great dexterity.

Although the volcanoes we purpose to ascend are not visible, on the opposite side of the bay, near Endermo, a large white and sulphurous-looking mountain, with four craters thereon, is perpetually smoking. Here the only object of interest is a profusion of magnetic iron-sand on the beach, very similar to that I have seen at Taranaki, in New Zealand. In this vicinity it is found of so pure a description that it is smelted by the Japanese.

The specimens I obtained contained about fifty per cent. of metallic iron.

*Sept. 1st.* Early in the morning we started in a fishing-boat, called 'The Go Safely Over the Wave,' for Cape Yesan, with the intention of exploring the volcano of Ushiuruyama, which forms the highest land in that neighbourhood, namely, about 1900 feet. After a nine-mile row along a rocky, precipitous, and uninhabited coast, on which it would have been impossible to land under any circumstances, we reached a beautiful bay, just inside the cape, and lying at the foot of the volcano. Procuring a guide at a fishing-village, we skirted round its northern flank, and commenced a gradual ascent. Passing several fresh traces of bear, which are very numerous hereabouts, a two-mile walk brought us to the entrance of a gorge, which led into the crater on its western side. Here, by the banks of a freshwater stream, were some smelting works of the Japanese Government, and a very fair sulphur was being extracted from the earth selected on the mountain side.

Entering the crater we advanced towards its centre, in order to form an idea of its configuration. Though there were hardly any traces of lava or pumice in the vicinity, or other evidence of violent eruption, it seemed as if one half the mountain had sunk several hundred feet, leaving an almost perpendicular wall about 600 high, on the north side of the crater, and also one 200 feet high on the south side. The western and eastern sides being washed away by hot mud and water.

The floor of the crater, if I may be allowed that term, extended about half a mile from north to south, and three-quarters of a mile from east to west. It is very irregular, and, like the sides of the mountain, is formed of sulphurous earth. Steam was ascending in many places, and several geysers were roaring in different directions. Altogether, the scene strongly recalled the Geyser district of Iceland to my memory: the same brilliancy of the sulphurous clays, the sharp denotating reports, the roaring of these boiling caldrons, and the spiral jets of steam, everywhere spoke of the turmoil below, and of that vast subterranean seam of fire which extends from Kamskatka, through the Kuriles and Japanese group, to Formosa, the Philippines, and Java.

Nowhere in this volcanic rent do more active evidences exist than in the neighbourhood of the straits of Tsugar: within a few square

miles are found five active and six dormant volcanoes, and hot-springs abound in many places. Here, on its northern side in Yesso we have Volcano Bay, with three active volcanoes on its shores, and three dormant ones in its immediate vicinity; at its western entrance are two active volcanic islands, and on its southern side three extinct craters in the northernmost extreme of Nippon.

Of volcanic history in Japan we know little or nothing; but a more intimate acquaintance with its literature will bring extensive and minute records to light, and of this we already have the foreshadowing.

With regard to this volcano it is very difficult to obtain anything like trustworthy information of its antecedents. Many of its hot springs are intermittent, and their tubes and cups are constructed by a silicious deposit, in the same manner and form as in Iceland. But none of them have approximated to that perfection of form and eruption which characterises some of the larger geysers in that country.

Ascending the northern face of the crater—a matter of considerable difficulty—I arrived at the highest point of the mountain, and obtained an extensive view of the surrounding country, the Straits, and Nippon.

The summit and northern slopes of the mountain are composed of rock, so much decomposed by heat and water that it is almost impossible to determine its formation. Verdure there is none.

At four o'clock in the afternoon we commenced our descent on the northern side, which is very steep, and, subsequently regaining our boat, reached Osarcibē before midnight.

*Sept. 2nd.* In the morning we started along the shores of the bay for Sarawa, a considerable village near Cape Suyusaki. We passed several hamlets and small streams; on the banks of one of them, in a secluded glen, we found an Aino settlement, and had thus an opportunity of seeing something of the original inhabitants of Yesso and the northern portion of Nippon.

The Aino men came out at once to welcome us; for, although their manner with the Japanese is abject and timid, they have a great liking for strangers, to whom they are always hospitable and well disposed. Their mode of salutation is somewhat peculiar: they first rub their hands together, then raise them slowly to the forehead, and subsequently stroke their long black beards. Though their stature is moderate, they are well and strongly built, and their physiognomy is decidedly good, approximating much more to the European than the Asiatic type. Their complexion is white, though sunburnt, and they have an exuberant development of hair on head and body: hence they have been termed by some the “Hairy Kuriles.” Were it not for their soft black eyes, they would have a decidedly savage appearance. Their women

were of the healthy rustic type, and cultivate their natural ugliness by tattooing their lips.

Their huts were of the poorest Japanese style, with little or no furniture, save cooking utensils and implements for fishing and the chase. There was no attempt at cultivation in the vicinity. Men, women, and children being busy in collecting kelp, which they barter with the Japanese, for rice, tobacco, and cottons,—their only requirements, excepting those provided by fishing and hunting.

On poles hard by were a couple of bears' skulls,—the guardian deities of the settlement; for, although the Aino wages incessant war with the bears for their flesh and skins, the bear is their principal divinity, and is always cut up with religious ceremony. His head, which is considered sacred, being preserved as a talisman against evil.

The costumes of the Ainos is a simple flowing robe of skin or cotton, reaching to the knees, and secured with a girdle round the waist, and their appearance is dignified and patriarchal. Written language they have none, and their tongue, like the tribe itself, stands isolated from all others in North East Asia.

They have, however, numerous legends concerning their origin, all of which agree in one point,—that they came from the West. One of these legends much resembles the Mosaic account of the Creation. It tells of how, after the earth emerged from the waters, a woman came from the West, and established herself in a beautiful garden in Yesso; which garden yet exists, though no one knows whereabouts. There this lady lived in great purity and delight, until Adam, in guise of a dog, tracked her home after a day's hunting, and demanded hospitality. From this pair sprang the whole Aino race.

Owing to the imperfect knowledge we possess, both historical and ethnological, of North-Eastern Asia, we cannot trace the Ainos to their cradle. But as on the shores of Eastern Siberia, and particularly in Castries Bay, the ancient inhabitants have much similarity with the Ainos in appearance, manners, and customs, it does not seem improbable that they formed part of a pre-historic migration from the West, which followed the course of the Amur from Central Asia to the sea, and thence crossing to Sagalien and Yesso, extended their sway both in the Kuriles and in Japan: and subsequently were driven back, in the north-east by the Kamschatkan tribes, in the north-west by the other nomadic tribes which followed them to the Siberian coasts, and in the south by the Japanese; who, about the end of the fourteenth century, after a lengthy and sanguinary struggle, confined them to their present abode in Yesso. Since that period they have been gradually diminishing, until their present numbers are scarcely 50,000.

These, for the most part, live in the interior, in societies of from ten to twenty families, governed by their own hereditary chiefs. All official jurisdiction, however, rests with the Japanese, who are exceedingly severe with them, and treat them as inferior beings, exacting the greatest respect on all occasions, and an annual tribute of furs, dried salmon, &c.

The sole custom they have adopted from the superior civilization of their conquerors, the Japanese, is that of taking as many wives as they can support, instead of, as formerly, restricting themselves to one.

Such is a brief sketch of the Ainos, who in the middle of the nineteenth century offer us the singular spectacle of a people who have not yet emerged from the lowest step of patriarchal civilization. The earliest written records we have of their existence are in the Japanese annals of the reign of the first Mikado, twenty-five centuries since. Then, the Ainos were masters of the northern provinces of Japan, and were treated by the Japanese as their equals; but they have gradually succumbed before the energy and civilization of this offshoot of the Malay race, and in their melancholy countenances may be read their history,—that of a once numerous and sturdy people crushed by centuries of misfortune and oppression, rapidly descending into the great tomb of lost nationalities.

La Pérouse has written their epitaph in touching language. In speaking of the Ainos, he says:—"There is no doubt they have great consideration for their parents, and that their manners are very gentle; it is equally certain they were shepherds, and had numerous flocks. I cannot form any other idea of the manners and customs of the patriarchs."

Shortly after leaving the Aino village, we came in view of the volcano of Komanartaki, and at 3 P.M. passed through the villages of Great and Little Scarbē situated on the banks of the river, which runs into the bay from the lake of Konomar. We now commenced crossing a portion of the great pumice waste, which extends for many miles round the eastern slopes of the above volcano. Large portions of the forest which clothe its northern and north-eastern slopes have been recently destroyed. Many of the charred trunks are standing out like beacons in their sea of pumice. The age of these trees, is apparently about seventy years, whilst here and there young ones of about ten years' growth are springing up beside them. These trees furnish a key to the dates of the recent eruptions, which are also written on the cliffs which margin the bay. There, the cliffs are abrupt and about sixty feet high, and are encrusted with four distinct layers of pumice, each separated by a thin stratum of soil. The first, or

more recent, is about eight feet thick ; the second about ten inches ; the third about three feet ; and the fourth about five inches. The whole resting on the light clay of which the cliffs are formed.

Skirting the pumice district and destroyed forest, we cut off the angle of the coast formed by Cape Snyusaki, and, passing through a rich grass country abounding with cattle, arrived at Sarawa late in the evening.

*Sept. 3rd.*—This morning we followed up the coast as far as Mori, the largest town on the shores of the bay, and thence struck inland to Konomar, a tea-house on the banks of the lake of that name, which lies on the southern side of Komanartaki, and where we hope to obtain guides to ascend the volcano.

This road, which is a portion of the highway from Hakodadi to the eastern districts of Yesso, is exceedingly beautiful. It traverses a forest, where noble trees and greenswards abound and lakes are sprinkled about. A high range of hills margin the right-hand side, and on the left the volcano towers above to a height of 3000 feet. It seems to have a special regard for Mori, all the desolation it has occasioned being in the opposite direction.

*Sept. 4th.*—In the morning we retraced our steps some 3 miles to a hamlet called Sigonobi, and, having procured a guide, struck through the forest to the pumice waste between the lake and the mountain. Traversing this pumice is very tedious, as it is in blocks of all shapes and sizes, piled up here, ploughed into ravines there—the result of the melting of the snow in the spring of the year. Dismounting, we left our ponies, and commenced the ascent on foot. After two miles of very indifferent walking, we found ourselves within a mile of the lip of the crater, and on a much more even surface ; as we advanced, the hollow sound produced by our steps convinced us that we were on the roof of some gigantic cavern. On arriving at the mouth of the crater, we had an admirable view of the interior, which covers an area of about one mile from north to south, and two miles from east to west. Its northern and western sides are formed by the loftiest portion of the mountain, and are about 600 feet high, and perfectly perpendicular. From the southern side—that by which we had arrived—there is a gradual slope towards the interior. In an easterly direction there is a gentle descent from the floor of the crater into the valley beneath the mountain. Steam was issuing from all parts of the interior of the volcano, which for the most part is formed of sulphureous clay. Several hot-springs were in operation in its eastern portion. In the southern and central ones the bed of the crater is hove up in a succession of domes of greater or less extent. These surfaces are cracked and fissured in all directions, with much steam



escaping; altogether unsafe travelling, as these hot clay surfaces are constantly yielding to the foot.

In the north-west corner of the crater is a new one, about 90 feet in depth, and 150 feet in diameter; this was the source of the last eruption in 1855. At present it manifests but little sign of activity.

We learnt from our guide that the two last eruptions of this volcano took place in 1855 and 1796; dates which nearly correspond with the conjectures one had been led to form, from the destruction of the forest and the marks on the cliffs in Volcano Bay. During the eruption of 1855, pumice, ashes, and hot water were alone ejected.

In the evening we returned to Konomar and the following day to Hakodadi.

*Sept. 8th.*—I started by Konomar and Mori for Yama-coushinai, a village at the head of Volcano Bay, in order to join the Prussian Consul-General, who contemplated an extensive journey beyond Endermo, and thence across the island, returning by way of Matsmai.

Sleeping at Mori, early on the morning of the 9th I followed up the shores of the bay towards my destination, crossing two large streams, and passing Otosbê, and other fishing-villages, and another Aino settlement, I arrived at Yama-coushinai at noon. The country about the head of the bay is very beautiful, and very fertile, and the slopes which run up from its shores to the high mountain land of the interior are covered with magnificent trees. Although the two volcanoes I have ascended are not in view, the one near Endermo is very prominent, with its four vents in a state of activity; whilst in the interior, in the same direction, are three other mountains, which, from their configuration must be volcanic. One of them, called False Fusi-yama, from its resemblance to the famous mountain of that name in Nippon, is about 7000 feet in height.

The Prussian Consul-General, who had made one exploring expedition to some hot-springs in the interior, was suffering much and was compelled to abandon his idea of proceeding further. As it is only foreign representatives that have the right of moving more than 25 miles from the treaty ports in Japan, I was most reluctantly compelled to abandon my hopes of seeing something of the interior of Yesso: a country very little known even to the Japanese themselves, their knowledge being confined to the sea-board and navigable rivers; the interior being left to the Ainos, and the bears and deer with which it abounds.

At 2 P.M. I started for Hakodadi, where I arrived the following morning: having ridden about 120 miles in 48 hours on the same

pony; a pretty good proof of the powers of endurance of those animals in this country.

No observations of any sort were made during my journey, for fear of giving offence to the Japanese authorities, who are to be found in every little hamlet, and whose conduct, together with that of villagers, was always most friendly.

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XI.—*On the Effects of the Destruction of Forests in the Western Ghauts of India on the Water-Supply.* By C. R. MARKHAM, Esq., F.S.A., Secretary R.G.S.

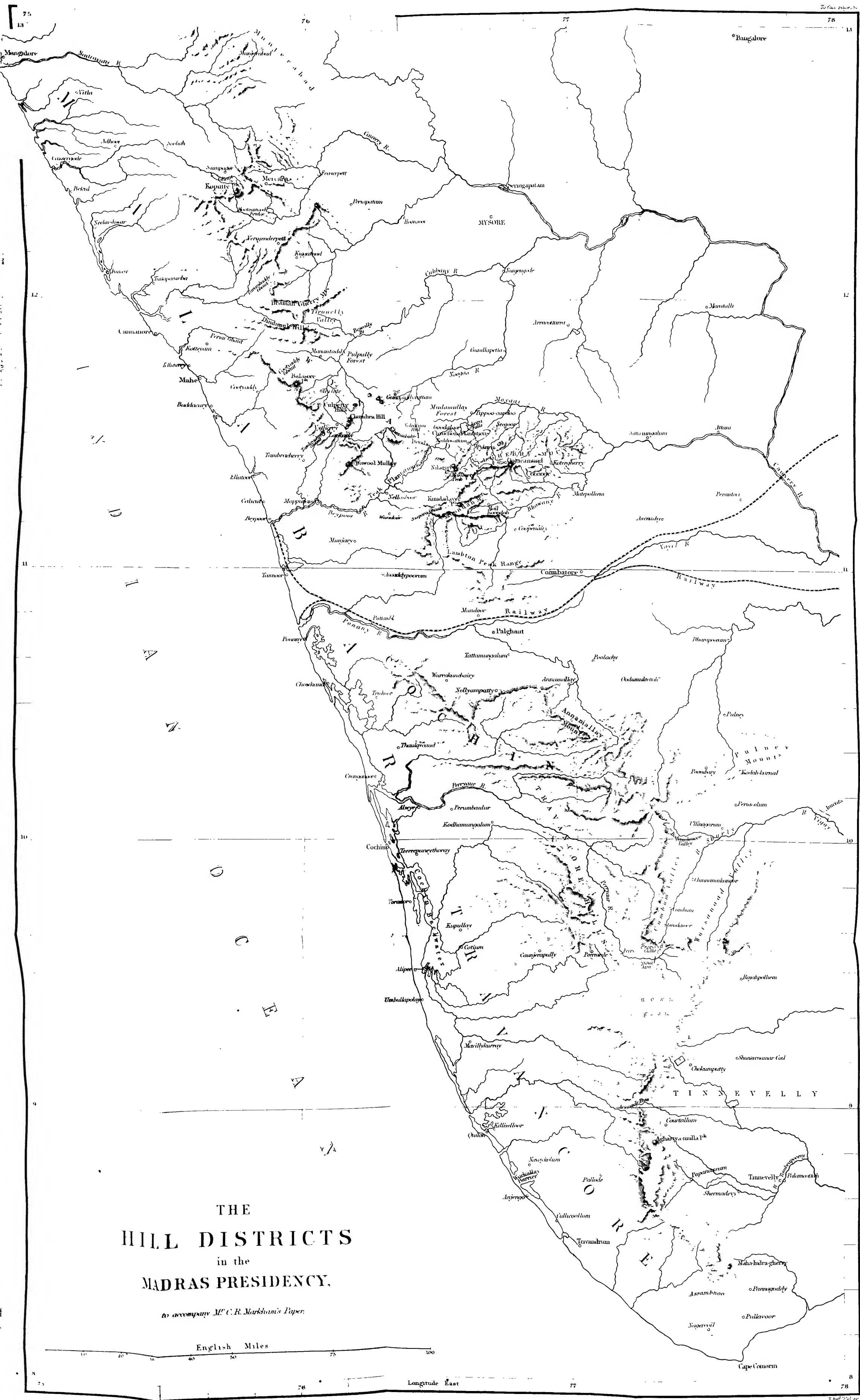
*Read, June 11, 1866.*

HUMAN action has produced great changes in the physical condition of the earth's surface. Vast tracts of swampy wilderness have been converted into fresh pastures or cultivated fields, and barren uplands have been covered with stately trees. On the other hand, many regions, in all parts of the world, which were once clothed with verdure are now treeless and arid wastes. All these changes are the work of man; some took place centuries ago, others are going on now, under the eyes of this generation. The destruction of forests has been one of the chief agents in effecting changes in the earth's surface, and the best methods of counteracting evils which may be caused by these extensive clearances is one of the most important questions that occupy the attention of physical geographers.

This agency is now at work in the Western Ghauts of India, those rich and beautiful mountain-districts forming the backbone of the Indian peninsula, and containing the sources of a water-supply, on which the prosperity—indeed, the very existence—of millions depends. The Western Ghauts of southern India, or rather that portion of them to which I now allude, extend for nearly 300 miles from Nuggur, in Mysore, to within a few miles of Cape Comorin, and have an area consisting of forest-covered slopes, grassy plateaux, and rocky peaks and ranges, covering somewhere about 7000 square miles.

The most northern part of the range is comprised in the two Mysore districts of Nuggur and Munjerabad, in the former of which are the sources of the Toongabudra; while the latter sends its waters to the Cauvery. Then comes the lovely little mountain-district of Coorg, containing the fountains of the sacred river Cauvery itself. Coorg is divided from the Wynaad district by the Bramah-gberry Mountains, and Wynaad extends for a length of about 50 miles to the feet of the Neilgherries, which rise up from





the Wynaad plateau like a massive wall, with many silvery cascades pouring over its face. On the western, or Malabar side, the mountains of Coorg and Wynaad rise abruptly from the plain, and are covered with magnificent forest. The plateaux are broken into a succession of ridges, sometimes rising into lofty peaks, which enclose valleys or flats—usually one mass of rice-cultivation; and on the eastern side the descent is more gradual, and is covered with forest.

The taluq or district of Wynaad is a plateau, averaging an elevation of 3000 feet above the sea, in the direct line of the Western Ghauts, between the mountain-knot of the Neilgherries on one side, and that of Coorg on the other. It is about 60 miles long, by 30 broad, and contains an area of some 725,000 acres. On the Malabar side, the upper half of the mountains consist of a succession of stupendous mural precipices, broken here and there by ravines and spurs, and wherever there is a foot-hold the ground is covered with magnificent forest-trees, many of them yielding valuable timber. On this western side there are several mountain masses which rise from the plateau to a height of 5500, and even 6000 feet, their sides clothed with forest, and terminating in well-defined peaks. One of these, the Velery-mullah, extends far out into Malabar. The others are the Chumbra, the Culpetty, the Koocha-mulla, and the Balasore hills. Their northern aspects are well adapted for chinchona cultivation, while their southern slopes, receiving the full force of the south-west monsoon, are less favourable to vegetation. Their rainfall is about 150 inches annually. The scenery of this western part of Wynaad is exceedingly beautiful, consisting of precipices of gneiss, rising out of forests clothed in many varied tints, rapid torrents and waterfalls, and wide views of the low country. From the western mountains the land slopes gradually down to the Mysore frontier, in a succession of ridges or low ranges of hills, intersected by swamps or flats, which, when left to nature, are overgrown with *pandanus*, but which are now for the most part covered with paddy cultivation. The ridges and hills consist of long stretches of grass-land, dotted over with clumps of bamboos, mango-trees with wide-spreading branches, and flowering shrubs, such as *Solanum Indicum*, a *Crotalaria*, a *Lobelia*, called by the planters wild tobacco, and an *Osbeckia* with a very pale purple flower. The leafless but bright-flowered *Erythrina*, and the wooden-fruited *Bignonia xylocarpa*, are also common. If the bamboos were absent, the central part of Wynaad would look like a beautiful but neglected English park. Occasionally isolated masses of gneiss rise from the plateau, some, like the hills of Nelialum, ending in needle-like peaks, others forming craggy precipices. These are the Nelialum Hills and Cheramecottah in south-east Wynaad, Cunjittecottah, Yeddacul near Sultan's

battery, the Meenangaddy rock, Jiganabettah near Culpetty, and the "Central Hill" of Wynaad. All these are conspicuous landmarks. The eastern side of Wynaad up to the Mysore frontier consists of a belt of dense forest, here and there intersected by paddy flats (and we call these low swampy valleys on each side of a stream *paddy flats*, whether they are actually cultivated or not) for a width of 15 to 20 miles. The climate is here much drier than on the western side, and the trees, consisting chiefly of the deciduous teak, are stunted and undersized. There are extensive fires in the dry weather, when the traveller may ride for miles through a hideously desolate forest of trees with charred and blackened stems and leafless branches. The bright little *Indigofera pulchella* by the road-side alone relieves the dreariness of the scene. The Mudamullay forest, on the south-east side of this part of Wynaad, is worked by the Government for its teak and sandal-wood, being rented for 99 years from the Nelemboor Terupad, whose claim to it was very questionable, for Rs. 3500 a year. The rest of the forest near the Mysore frontier belongs to Government, with the exception of a large block, the claim to which by the Pulpully devasum has been allowed. The managers of the pagoda declare that their god does not allow it to be touched, and they will come to no terms with the Government with regard to the timber. The claim of the Tirumelly pagoda to another block of forest has been disallowed.

The drainage of the Wynaad district, excepting the torrents which dash down the western mountains during the south-west monsoon, is entirely to the eastward; the numerous streams uniting to form three rivers, which are tributaries of the Cauvery. The Moyaar drains South-east Wynaad and part of the Neilgherries, the Noogoo drains South, and the Cubbany North Wynaad. All the streams are fordable in the dry season, though the banks are often steep; but during the monsoon they swell to an immense size, often rising 30 feet, with a width of 200 feet, and dashing furiously along with masses of tangled branches and uprooted trees.

Coffee planting commenced in Wynaad in about 1840. Now there are 192 coffee estates, of which 9865 acres belong to Europeans, and 4748 to natives, actually planted.

South of Wynaad the great mountain-mass of the Neilgherries and Koondahs rises to a much higher elevation, the plateau being 7000 feet, and the highest peak 8829 feet above the sea. The area of the Neilgherries contains 268,494 acres. The formation, like that of Wynaad and Coorg, consists of syenitic granite, with veins of basaltic rock, hornblende, and quartz, while in some parts half-decomposed laterite underlies the soil. The plateau of the Neilgherries is not a flat table-land, but consists of a succession

of undulating hills and intervening grassy valleys, with ravines thickly wooded, numerous streams, and occasional rocky ridges running up into fine mountain peaks. The streams all go to swell the great river Cauvery by its tributaries the Moyaar and Bowany; the Moyaar descending from the hills by a grand waterfall in the Pykara chinchona-plantation on the northern slope; and the Bowany flowing down between the Koondahs and Neilgherries to the south. The soil of the plateau is very rich, being formed by the decomposition of basaltic and hornblende rocks, mixed with clayey products of the granite and decomposed vegetable matter. There are extensive deposits of peat in the valleys, which afford supplies of fuel. The chief defect in the soil is the absence of lime. On the open plateau, in the wooded *sholals*, and in the thick forests of the lower slopes, there is a great variety of beautiful flowering trees and shrubs. First in the brilliant splendour of its flowers must be mentioned the tree-rhododendron (*Rhododendron arboreum*), which is very common in all parts of the hills. In the wooded ravines are the *Michelia Nilagiraca*, a large tree with fragrant flowers of great size; the *Symplocos pulchra*, with hairy leaves and snow-white flowers; the *Ilex Wightiana*, a large umbrageous tree; the pretty pink-flowered *Rhodo-myrtus tomentella*, or hill gooseberry; the *Jasminum revolutum*; the *Sapota elingoides*, a fine forest-tree; *Crotalaria*, *Bignonia*, and a number of chinchonaceous trees. On the open grassy slopes the most common shrubs are a *Labellia*, a *Crotalaria*, a *Vaccinium*, a *Berberis*, and an *Osbeckia*, with a purple flower of a much darker shade than appears on the same shrub at the lower elevation of Wynaad.

South of the Neilgherries that remarkable gap in the ghauts occurs at Palghat, which enables the railroad to pass from sea to sea—from Madras to Bellore. The eastern drainage from Coorg, Wynaad, and the Neilgherries is all to the Cauvery.

The mountains south of Palghat are thus completely isolated from the main range of the ghauts. They comprise the glorious Anamallays and Pulneys and the hills of Travancore, including vast forest-covered tracts as yet unexplored, and containing the sources of water-supply for Madura and Tinnevely; and those of the great river Periyar, which now pours its floods uselessly into the Cochin backwater.

The mountains from Palghat to Cape Comorin may be divided into two distinct regions for purposes of description, which are separated from each other by that extensive unknown tract of country, where the sources of the great river Periyar are still concealed from our knowledge. The southern region extends from Cape Comorin to Courtallum, and comprises the mountain chain which divides Travancore from Tinnevely. Near Cape

Comorin, isolated masses of weather-beaten rock rise abruptly from the plain, and form an outline of battlements and pinnacles against the sky; and the continuous range only commences north of the Aramboly Pass, where the mountains attain a height of 3000 feet and upwards. The range is not broad, and has little or no intermediate table-land, but slopes abruptly from the summit ridge to the rich green expanse of Travancore on one side, and to the dried-up plain of Tinnevely on the other. The peaks rise to a height of 6000 feet. Several coffee estates have already been formed on these hills. The most southern are at Assambhoo, at an elevation of 3000 feet, immediately above the Aramboly Pass. The principal drawback to this site is its exposure to severe gales of wind, which do much injury to the plants. Further north, and on the Tinnevely side, at the feet of those grand precipices called Maha-Indra-gherry and Tiranamullay, there is a small coffee estate, owned by a wealthy and liberal-minded Mohammedan, named Meer Anjemir, who lives at Pannaguddy. At the foot of the peak of Aghastya-mullay, in Travancore, a fine tract of forest land has been purchased, and there are several coffee estates round Courtallum.

There is a notable difference between the climate on either side of these ghauts. On the west side the slopes are abundantly watered by the south-west monsoon, and the streams fall into the backwater, supplying the narrow strip of land with water in abundance. On these Travancore hills clearing may be carried on to any extent, without detriment to the low country, which could well dispense with some of its surplus moisture. But, on the east side, the due supply of water for the tanks and channels is a necessary of life to the people inhabiting the wide plains of Tinnevely. Indiscriminate felling on these eastern slopes would lead to most deplorable results, and the evil is already beginning to be felt. Further grants of land have been prohibited in the Tenkassy Taluq, and in Nanganary the people complain bitterly of the drying-up of the streams. There can be no doubt that serious consequences will arise from indiscriminate felling; but, when Rs. 1,84,000 are required for the repair of tanks and channels in Tinnevely, and only Rs. 48,000 are granted, the failure of water cannot be *entirely* due to a reduction in the rainfall caused by clearing on the hills.

The northern division of the mountainous country extending from Palghat to Cape Comorin includes the Anamallay and Pulney hills in British territory, and an extensive hill district within the native states of Cochin and Travancore. It differs from the southern division in possessing several ridges with wide stretches of table-land, instead of a single line of mountains sloping directly from their summits to the plains on either side.



There is a very extensive mountain region between the plains of Travancore and those of Madura. The southern portion, extending over an area of about 30 miles by 20, out of which issues the river Perryaur, is entirely unknown and is a blank on the map. The northern part borders on the Anamallays, and is almost as little known. The great river Perryaur, flowing from south to north, traverses the centre of this mountain region, and, after a long course, eventually turns to the west and falls into the Cochin backwater. In December, 1865, I crossed this mountainous country on foot, with Dr. Cleghorn. Our route passed right over it, crossing the Perryaur. The mountains are owned, under the Travancore Government, by the petty Rajah of Pooniat, and from time immemorial there has been a track called the Pooniat Road, traversing Peerméde and passing down into the Cumbun Valley on the Madura side. It was used by the elephant-hunters whose old pits are still to be seen, and by the Pooniat Rajah's cardamom gatherers. The ancient Pandyan kings of Madura are said to have received their supplies of betel, pepper, and cardamoms by this route, in exchange for rice and cloth. At present the Madura people annually drive their herds up to these mountains for pasturage, but the only inhabitants are a wild tribe of wandering hill people called Uralas. They are seldom seen.

The distance from Peerméde on the western edge of the mountains, where there are several coffee estates, and a chinchona-plantation, to the Perryaur River is  $7\frac{1}{2}$  miles on the map, 10 miles by our route; from the Perryaur to the eastern crest of the ghauts,  $5\frac{1}{2}$  miles on the map, 8 miles by our route; from the crest of the ghauts to Goodaloor, on the Madura side, 8 miles on the map, 12 miles by our route. A total distance of 30 miles on foot, over a most difficult country.

The road leads from Peerméde across grassy uplands, with much rock on the surface, to the river Urraday, and crosses the stream at the Urraday Tavalum. These *Tavalums* frequently occur on the map. They are merely places where herdsmen are in the habit of resting their bullocks, and are known by several acres being overgrown by a species of *Compositæ* (*Blumen*), the result of bullock manure. The land must be very rich and valuable. There are several magnificent *sholahs* on the hills overhanging the Urraday, and facing to the westward; but after crossing them the country to the eastward presents a hotter and drier appearance, the *sholahs* are smaller, there are large patches of *eetah* bamboo in them, indicative of a poor soil, and they often only extend a few yards on either side of the streams. We saw several bison on high hills to the south, sambar bounded before us into the *sholahs*, and there were numerous traces of elephants and cheetahs. We passed through the *Pambanum* (snake) *Tavalum*,

and over hills covered with grass 10 and 12 feet high, a most blinding and tedious march, and finally came by a steep descent, through bamboo jungle, to the banks of the Perryaur.

Although this was nearly the lowest season, the river was 30 yards across, and we found by the marks that, during the monsoon, it rises 8 feet higher. The whole of this immense volume of water now runs to waste in the Cochin backwater. But there has long been a project to build a dam across, at a point 13 miles south of where we crossed, and to make a cutting, so as to throw the river over into the Madura district.

The coffee plantations have already begun to attract traffic over this formerly unfrequented route, and before long, a good bullock-track, and a bridge over the Perryaur, will become an urgent requirement of the district. The rice and cloths of Madura will be exchanged for the silver of the planters and the betel, cardamoms, and tobacco of Travancore. We found 200 bullocks on the banks of the Perryaur, laden with rice for the coffee plantations, coming from the Cumbum Valley. The bullocks were driven in, and made to swim across, while the bags of rice were ferried over on a rude bamboo-raft; a process which seemed likely to occupy at least twenty-four hours. One only has to be a witness of proceedings such as this, to be deeply impressed with the delay and injury caused by the absence of bridges. We crossed the river on the same bamboo-raft, but the coolies with our tent did not arrive until late, having been driven or rather frightened off the road by a herd of wild elephants. The river is here lined on both sides with clumps of bamboo; the bed is very rocky, and the water clear and cool. As night closed in, the fires of the herdsmen and the mass of white bullocks under the bamboos were finely reflected in the river. Fires throughout the night were necessary, to keep off the tigers which abound in extraordinary numbers, denoting the great abundance of other kinds of game.

After passing up the bamboo-jungle which fringes the river on the east side, we entered upon a country presenting a still more dried-up appearance, though the grass was of immense height. Stunted trees were scattered over the open hills, chiefly *Terminalia coriacea*, and here we met with the first teak-trees. The land is formed into a large amphitheatre of hills, with two sharp peaks, and after descending the slopes, we entered a thick bamboo-jungle, and had to wade along the bed of a torrent up to our knees for a considerable distance. The woods abound in black monkeys with white beards, jungle fowl, and imperial pigeons. The Goodaloor Tavalum is an open space in the midst of the forest, about  $5\frac{1}{2}$  miles from the Perryaur, and close to the crest of the eastern side of the ghauts. The descent into the Cumbum Valley is rapid and precipitous, over huge boulders of rock, and often crossing a

mountain torrent. The ghaut is clothed with splendid forest-trees. Black wood (*Dalbergia latifolia*), one of which I measured 4 feet from the ground, and found to be 17 feet in girth, and another was at least of equal size; *rengay* trees (*Pterocarpus marsupium*), yielding excellent wood for building purposes, as well as the gum *kino* of commerce; a tree called locally *vekali* (*Conocarpus latifolius*), the wood of which is also used for building; the black dammer-tree; and, lower down, great quantities of the loathsome *Sterculia fetida*, which yields an inferior kind of poon spar. Here and there we got peeps of the rich Cumbum Valley as we descended, with mountains on the opposite side. On first coming out into the valley, there is a wide stretch of open grass-land dotted with the *yerkum* bush (*Calotropis gigantea*), where immense herds of cattle were feeding, and further on there are fields of castor oil, and fine crops of toor and raggee.

The Anamallays have been well described in Dr. Cleghorn's work, and an account of the Pulneys will be found in my 'Travels in Peru and India.'

It is scarcely necessary to say that the rainfall along these Western Ghauts is derived almost entirely from the south-west monsoon, and that consequently nearly the whole of it is deposited between the months of May and September. But it is worthy of note that the amount of rainfall along the ghauts decreases as Cape Comorin is approached. Thus at Mahabaleshwar, near Bombay, it is 248 inches, while at Trivanderum, the capital of Travancore, it is 65, and at Cape Comorin itself only 30 inches. The gradual narrowing of the peninsula will probably account for this phenomenon. The heaviest rainfall of course takes place along the western faces of the ghauts, where the clouds, heavily charged with the moisture from the Indian ocean, suddenly enter the colder stratum caused by the mountains, and are at once condensed. As they advance across the plateaux the amount of rain deposited by them sensibly decreases; and the rainfall, in special localities, is affected by the smallest variations of aspect and shelter. Thus the western forests of Nuggur, Coorg, Wynaad, and the Koondahs, receiving the full force of the monsoon, have a rainfall of about 200 inches, while at short distances to the eastward it is much less heavy. At Mercara, in the centre of Coorg, it is 145 inches, and at Nuggur about 100. The effect of aspect and variations of exposure on rainfall is well shown on two estates on the slopes of the Chumbra Hill, which rises out of the Wynaad plateau. On the one with a western aspect it is 186 inches, on the other, within a few miles, but sheltered by the peaks of the Chumbra Hill, it is only 154 inches. At the Nediwuttum cinchona-plantations on the Neilgherries, which are about 8 miles to the eastward of the line of mountains on which the monsoon rains first burst, the

rainfall is 127 inches. At the Dodabetta station, the highest peak on the Neilgherries, the average annual rainfall from 1847 to 1855 was 86.13 inches; the maximum annual rainfall being 102.83 in 1847, and the lowest 65.99 in 1848.

Although the rainfall thus varies, according to local circumstances, every particle of moisture is wrung out of the clouds in their passage from the Indian seas, by the intervention of the mountains. The forests which clothe their sides, and fill the valleys and ravines on their plateaux, have the effect of regulating the flow of water to the eastward, but I cannot see that their presence or absence would have any influence on the actual amount of rain which falls on the hills. The intervention of mountains 8000 feet high, and the consequent change of temperature, will always wring the moisture out of clouds coming from the Indian ocean.

Within the last twenty years a great change has come over the mountain districts of the Indian peninsula, a change which is still in progress. An English colony is establishing itself in them, one which is, as I cannot help believing, of great promise, and one which is founded on different principles from any that has hitherto emanated from the British race. It is not a colony of needy adventurers and of labouring men, formed on the principle of exterminating the aboriginal population, and seizing their land: such as has swarmed upon North America, Australia, and New Zealand. But it is a colony of planters who generally enter upon the occupation of hitherto waste land, either belonging to the State or to native owners, the latter receiving its full value in parting with it. The native population, instead of being exterminated, as is the case in all other English colonies, make their own terms as labourers and carriers; and the extensive settlement of Englishmen on these hills, by raising the price of labour, has been almost an unmixed benefit to the natives, not only of the immediate vicinity, but of distant districts in all directions, to which the influence of the labour market extends.

On the other hand, the settlement of planters on the hills has given rise to wide-spread destruction of the primeval forest. The planters are occupied chiefly in the cultivation of coffee, to which have been recently added tea, and the quinine-yielding chinchona of South America. These three products give rise to the felling and clearing of forests, in the formation of plantations. In Nuggur, Munjerabad, and Coorg, several thousand acres have been taken up; in Wynaad about 16,000; on the Neilgherries some 9000, besides the Government chinchona-plantations; in the Anamallays some 600 acres have already been cleared; at Neliampaty in Cochin about 1200; at Peermède in Travancore, 625; and on the hills overlooking the district of Tinnevely some

500 ; making a total area of little short of 60,000 acres of forest destroyed. Nor has the process by any means reached its limit ; and a great change is taking place in the physical condition of the hill-districts.

It is impossible to exaggerate the importance of ascertaining exactly the nature of the changes caused by these clearings, and the best means of obviating the evils that may arise from them ; for on the nature of the water-supply from the hills depends the irrigation of a large part of the peninsula.

One obvious consequence of the destruction of forests is an increased rapidity of surface-drainage, giving rise to sudden and destructive floods at the outlet on the plains, where the change of slope causes a diminution of velocity, and to injurious freshes in the irrigating rivers after they have reached the plains. The effect of vegetation is undoubtedly to retard evaporation, and to check the rapidity of drainage ; and the removal of forests of course has an opposite effect. The hill-districts of India are now affording proofs of this law of Nature. The floods caused by the monsoon rains are yearly increasing in size and violence. To give one or two out of many instances :—During last monsoon two floods swept down the gorge at Coonoor in the Neilgherries, doing much damage, and they were of a volume such as had never been known before. Again, the bridge of the Mootramuddy in Coorg was swept away by the floods of 1863. Plans were drawn up for a new bridge which should be out of reach of all future floods ; but in the following year they rose to a greater height, and in 1865 higher still. All this is clearly due to the extensive clearance of forests, owing to which the rain-water rushes off the surface, instead of sinking into the earth and forming springs.

Major Sankey, in his interesting Report on the state of the roads in the Coorg district, has pointed out other injurious effects of indiscriminate felling on mountain-roads. The planters clear away the trees above these roads, and run horizontal drains to prevent the soil from being washed away from their coffee-plants. These drains become surcharged, burst at different points, and form perpendicular channels, at the end of each of which most formidable breaches are made in the roads. These breaches often occasion chasms in the roadway itself, and Major Sankey is of opinion that the original form of the hills may be permanently altered. The only remedy appears to be to preserve a broad fringe of trees and bushes above the road. Equally disastrous consequences arise from clearing below the roads which pass along a mountain-side. The water drains off the road ; the planter below naturally cuts a longitudinal drain to prevent his soil from being washed away, which operates to undermine the bank, and causes frequent breaches. Major Sankey, therefore, strongly urges the

necessity of preserving a belt of jungle both on the upper and lower slopes of all mountain-roads.

For the last twelve years, a system of forest conservancy has been established in the Madras Presidency, under the able and zealous superintendence of Dr. Cleghorn; with a view mainly to the preservation of valuable timber and of firewood, and to the retention of belts of forest near the sources and along the courses of streams. The construction of public works is by far the most important part of our mission in India, and their completion will form the chief, if not the only justification of our occupation of that vast empire. As a branch of the Public Works Department, a forest agency is very necessary, both for the supervision of selling and planting on a proper system, so as to ensure an adequate supply of timber for public works, and of fuel for railways; and for the conservancy of forests, to obviate the disastrous effects of indiscriminate felling on bridges, roadways, and irrigation works. The operations of this agency have been judiciously conducted, but it is not to be expected, nor even to be desired, on other grounds, that any government agency should hinder the very extensive embarkation of capital in such enterprises as chinchona, coffee, and tea cultivation. Teak, black wood, sandal-wood, vengay, and other trees yielding valuable timber, should be grown in large plantations near streams, by which they can be floated down to a market. These plantations must hereafter supply the demand for timber, and help to obviate the evils attending the destruction of the natural forests.

A noble commencement of such plantations has already been made at Nelemboor, in Malabar. The teak-plantations, for which India is indebted to the far-sighted wisdom of Mr. Conolly, commence nearly opposite Mombat, and extend for seven miles along the north, and for several miles along both sides of the Nelemboor River. The long vistas of tall and perfectly straight trees present a striking appearance. The stems are often without a branch for a height of 70 feet and upwards. Those planted in 1843 I found to be 5 feet 2 inches in girth, at a distance of 3 feet from the ground, and 90 feet high; those of 1847 were 3 feet 11 inches in girth, and 70 feet high. Several acres are planted every year, and the newest piece with the nursery, is now three miles beyond Nelemboor. The finest view of the plantations is from the bed of the river, where there is a foreground of drooping, feathery bamboos, above which the stately teak-trees appear with their large pale-green leaves, while the line of the Neilgherries, crowned by the needle-like peak of Makoorty, bounds the distant view. From 1844 to 1865 the number of teak seedlings planted was 1,678,679, covering 1696 acres; and in 1865 the receipts were 27,158*l.* against an expendi-

ture of 16,0261. These valuable teak-plantations are under the able superintendence of Mr. Ferguson, an experienced Scotch forester; and no better measure could be adopted for the future management of the forest agency than to establish a sort of school of forestry under Mr. Ferguson at Nelemboor, where natives might be trained and instructed.

There are also teak and sandal-wood plantations in the Mudamullay forest in Wynaad; a very fine plantation of Australian trees near Coonoor, on the Neilgherries; and a commencement has been made in Nuggur of another teak-plantation. The introduction of plantations of cork-trees into India, where there is every reason to believe that they would thrive, both in the Punjab and Himalayan slopes, and on the Western Ghauts, would likewise materially lessen the mischief caused by indiscriminate felling, while another valuable product would be added to the list of Indian exports.

It must also be remembered that one of the three products, the cultivation of which is now extending so rapidly in the hill-districts, will have the effect, in a few years, of supplying the place and performing the functions of the original forest. The beautiful foliage of the chinchona-trees, which after four years of growth are 20 feet high, will be as effective as the trees they have supplanted in preventing evaporation, regulating drainage, and receiving the moisture which is wrung out of the passing clouds. For this reason, as well as because it will be more remunerative and safer than coffee, and can be carried on in a healthier climate, chinchona cultivation deserves the notice of planters; while the healing qualities of chinchona bark should induce the Government to encourage its cultivation round the native villages in the hills, by offering prizes, and by every other suitable means.

In the end of 1866 there were upwards of 1,500,000 chinchona-plants in the government plantations on the Neilgherry Hills, besides many others under cultivation by companies and private individuals. It is the intention of the Government to plant 1200 acres with chinchona-trees, and to keep another 1000 acres as a reserve for further planting, if it should be considered desirable hereafter. Many hundreds of acres will soon be planted in addition, both on the Neilgherries and Koondahs, and in Wynaad, by English capitalists, as well as by natives; and the chinchona on the hills, like the teak on the lower slopes and in the plains, will tend to mitigate the effects of extensive felling.

Still many square miles will be bare, which once presented an unbroken surface of foliage. The forests will, to a great extent, disappear, and it is necessary that some other agency should be found to perform their duties—which are those of regulating and economising the drainage of the rain-water.

In almost all countries there is either something to check the rapid flow of the rain-water in surface drainage, or else there are disastrous floods. This agency acts as a sponge. It consists either of a large area of forest, or of swamp, or of peat-bog, or of a system of lakes, or of artificial reservoirs. In Yorkshire the sponge was provided by the undrained moors of the North and West Ridings. As these moors are drained the safety-valve is removed, and the heavy floods of the autumn of 1866 are the immediate consequence. If the moors are completely drained, artificial reservoirs must eventually be substituted, or the floods will be a chronic and increasing evil. In France there is no sponge of any kind to regulate the waters of the Loire, and consequently there are frequent and disastrous floods; while on the Rhone the lake of Geneva performs that important duty, and hence the floods are less violent and not so frequent. The river Po and its numerous affluents are always completely under control, because, at the head waters of each river, there is an efficient sponge provided by the lakes at the foot of the Alps. The river Ebro, in Spain, has no such moderator, and destructive floods in the country round Tortosa are, therefore, frequent.

On the Western Ghats the sponge is furnished by the extensive forests which clothe their sides, and when these are removed to any great extent, it is essential to the welfare of the whole peninsula of India that a system of storing water in large reservoirs or artificial lakes should be substituted. The subject has already received some attention, and Sir Arthur Cotton urged the necessity of forming reservoirs on the Neilgherries more than thirty years ago. Dr. Balfour has also written two valuable papers upon the subject. But nothing has been done, and we can, therefore, only glance over what has been proposed. And first as to the water-supply from the Nuggur and Baba Bodeen hills, which contain the sources of the Toongabuddra River. To this river the vast territory known as the Ceded Districts, as large as Ireland, and (if we except a few mangy babools) almost devoid of trees, looks for its future fertility. The Choardy, Toonga, Budra, and Huggry, are the affluents which form the Toongabuddra, and, if the means of raising two crops is ever to be furnished to the lands within reach of the projected irrigation works in the Ceded Districts, large reservoirs must be formed in the hills, on the upper courses of these streams. The most favourable sites are probably at the ancient tank of Mudduck Masoor on the Choardy, at Mudala on the Toonga, and at Luckawally on the Budra.

South of Nuggur, from Munjerabad to the Neilgherries, the whole of the streams rising in the hill-districts go to form the mighty Cauvery, a river on the waters of which depend the irri-



gation of a great part of Mysore, of that marvellously rich garden of Tanjore, and the projected conversion of the arid plains of Coimbatore into one sheet of cultivated land. Reservoirs have been proposed both in Coorg and Wynaad, and a very thorough examination of sites on the Bowany and Moyaar—the rivers that drain the Neilgherry and Koondah hills—was made in 1856 by Mr. Fraser, an engineer of the Madras Public Works Department. Detailed plans and estimates were then completed for a great reservoir on the Manal Kava. Another was proposed at a site about a mile below the junction of the Moyaar and Bowany rivers, where a bund might be thrown across a valley. The two rivers drain a catchment basin of 1600 square miles, the greater part of which is on the Neilgherry and Koondah hills. Another site for an artificial lake was suggested by Mr. Fraser, at a place called Palavur, on the Bowany River. Here a bund 852 yards long would form an artificial lake 45 miles round, with a capacity of 507,250,000 cubic yards of water; the whole area being now a wild and uninhabited jungle. Above Palavur there are several other good places for forming reservoirs on the Bowany; but on the Moyaar\* there are no favourable sites, though comparatively small basins might easily be formed. Finally, on the Neilgherries, the streams flowing through Love Dale, and from Bishop's Down and Marjanaad, unite in an extensive flat, where a large reservoir might be formed. The bund would be placed across a narrow gorge at the lower end of the flat, and would form a lake capable of holding 70,000,000 cubic yards of water.

In the Pulney Hills Colonel Douglas Hamilton has pointed out the site of an extensive ancient lake, which might be converted into a great reservoir: and there is a project for turning the waters of the Perryaur, which now run to waste in the Cochin backwater, over the eastern side of the Travancore Hills, and thus converting Madura and Ramnad into a garden rivalling Tanjore in fertility. The damming of the Perryaur will form a lake several miles in circumference. I may add that there is a very extensive tract of mountainous country, extending from the Anamallays to near Courtallum, which is almost entirely unknown, and awaits the researches of future geographical explorers.

From a careful investigation conducted by Captain Oakes, the Engineer of the Tanjore Division, it would appear that the clearance of forests hitherto made on the hills has not yet appreciably affected the irrigation in the delta of the Cauvery. Although the

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\* From Tippoo cardoo to the junction with the River Bowany, the Moyaar presents a singular instance of the action of a river in deepening its bed. The Moyaar ditch, as it is called, is 100 feet deep near the upper, and 800 feet at the lower end, the sides being very steep, and the land at the same level on both sides.

floods have been higher from 1856 to 1865 than from 1846 to 1855, on the Cauvery anicut, yet, owing to the duration of the floods during the former years having far exceeded that of the floods of the latter, and owing also to the fact that the height of the water at the Cauvery anicut throughout the period from 1856 to 1865 differed but little from that from 1846 to 1855, Captain Oakes concludes that the high floods of late years are attributable rather to a greater fall of rain than to the clearance of the catchment basin. It must be remembered, however, that the destruction of forests is very far from having reached its limit, that the rapid surface-drainage caused by it already effects much mischief in the hill-districts, and that, as the felling proceeds, these consequences may eventually be felt even in the Cauvery delta.

The construction of reservoirs in the hills is also a matter of great importance for purposes of irrigation. They will relieve the rivers of superfluous water when the floods are high, thus tending to prevent injury to the works, and furnish supplies for irrigation when the rivers are low. Every cubic foot of water which passes over an anicut into the sea, in time of floods, virtually represents so much food for the people recklessly wasted. The storage of water in reservoirs on the hills would prevent this waste, so that, while they are the obvious remedy for the evils caused by the destruction of forests, they are also essential to a thorough system of irrigation.

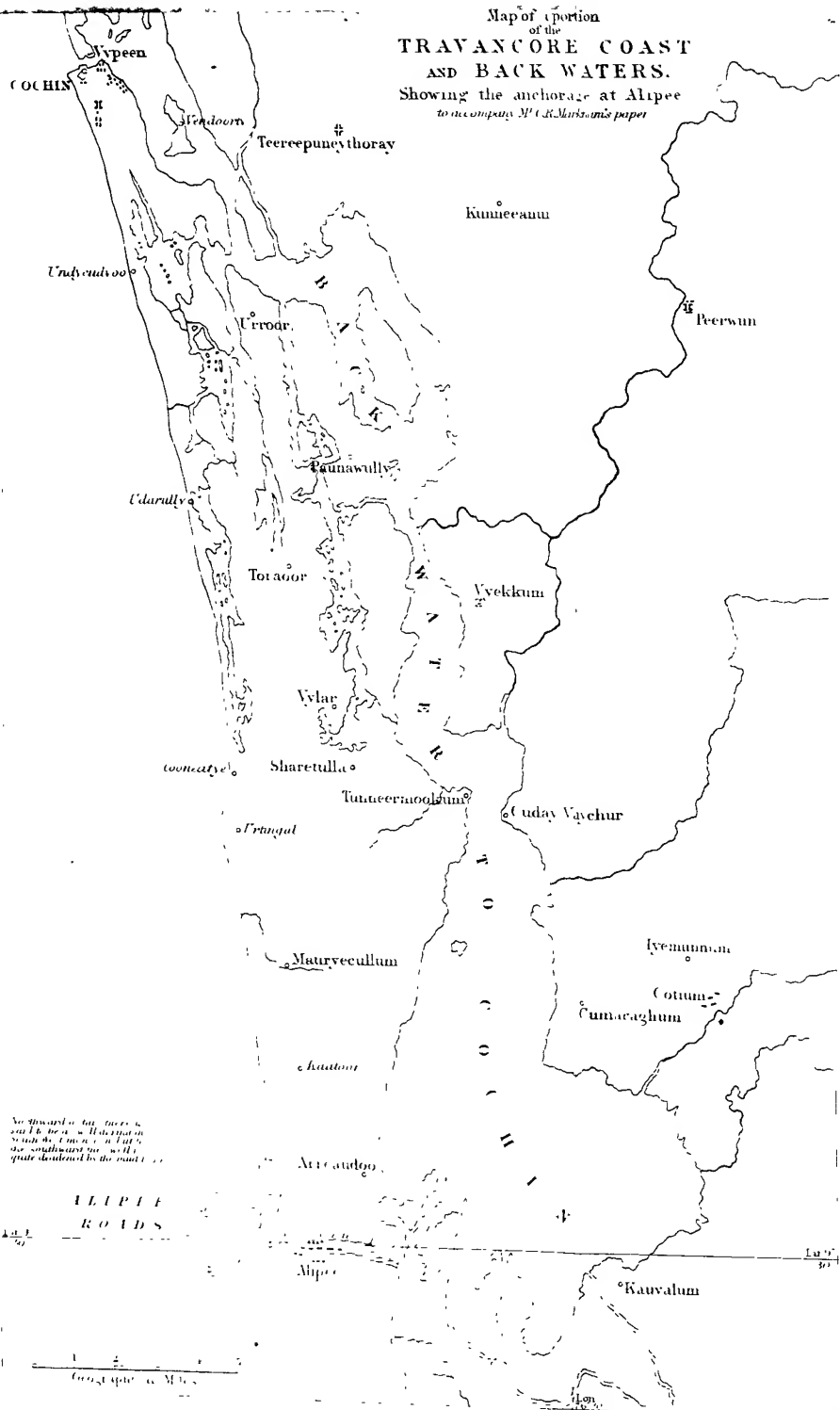
The deductions which I am inclined to draw from the above observations respecting the destruction of forests on the Western Ghauts are, that there will be an increase of surface-drainage likely to be very destructive to public works on the hills themselves, and eventually to be injurious to the great irrigation-works in the plains; the remedy for which evil must be sought in the storage of water by means of large reservoirs; and in the extensive planting of chinchona, teak, cork, vengay, black-wood, Australian, and other valuable trees; but that, owing to the clouds from the sea being intercepted by the mountains, there will be no sensible diminution in the actual rainfall throughout the year.

This latter remark is not intended to apply generally, for on plains and extensive plateaux the destruction of forests has certainly reduced the rainfall. Humboldt notices this result in the well-known case of the lake of Aragua in Venezuela. Sir Roderick Murchison has shown the great extent to which the mighty Volga has been lowered by the destruction of forests on the western slopes of the Ural Mountains, and by the drainage and improvement of marshy tracts. Commodore Jansen of the Dutch navy, who contributed one of the chapters to Maury's charming work, 'The Physical Geography of the Sea,' informs me of the same



Map of a portion  
of the  
**TRAVANCORE COAST**  
AND BACK WATERS.

Showing the anchorage at Alippee  
to accompany Mr. J. R. Markham's paper



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**ELLIPTICAL  
ROADS**

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effects from the same causes on the island of Curaçoa. General Baker has observed these results in the country to the westward of Hissar in northern India, and Mr. Fox Wilson has given us an interesting account of the desiccation of the basin of the Orange River. The whole subject is very ably discussed by Mr. George P. Marsh, in his work on 'Physical Geography, as modified by human action.'

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XII.—*On the Inland Navigation of Travancore; an Account of the Alipee Mud-bank and the Warkallay Barrier.* By C. R. MARKHAM, Esq., F.S.A., Secretary R.G.S.

*Read.* January 28, 1867.

THE Malabar coast country, including Cochin and Travancore, is furnished by nature with a highway which traverses nearly its whole length. The backwaters, which form this water communication, are continuous from Trivanderum to the railroad at Ponany, except at one point; and the completion of this grand system of inland navigation, by cutting through the single barrier, is most urgently required. I had the opportunity, in my journey through Travancore, in December, 1865, of examining this barrier.

But before describing the Warkallay Barrier, it will be useful to explain the natural causes which have given rise to the mud-bank of Alipee—a phenomenon as curious as its effects are useful. At no very distant date, geologically speaking, the sea appears to have washed the base of the ghauts. Two points ran out for a considerable distance, one of which is now represented by the Warkallay Barrier, the other by a ridge of laterite, to the northward of Cochin. A wide bay intervened; and the well-known Hindoo tradition relates how the sea was made to recede and leave a home for the Namburi Brahmans. Without doubt alluvial deposits gradually encroached upon the sea, which were checked by the waves of the monsoon, and eventually a belt of land was formed between the backwaters and the sea, now densely covered with cocoa-nut groves. This belt forms the present sea-coast; and at one point the famous mud-bank of Alipee, the chief port of Travancore, affords safe anchorage. The whole roadstead has a remarkably soft muddy bottom; and the fluidity of the water being diminished, while its activity is deadened by the accession of mud, the anchorage is very smooth in 4 fathoms, even while the swell of the monsoon is at its height in the offing. The mud-water extends from the beach to the anchorage, a distance of about 2 miles; and it is very curious that while the mud-anchorage always remains in the same place, the line of mud-water moves up and down the coast with the anchorage as a pivot, from about a

mile south of Alipee to 2 miles north of that port—the movement occupying a period of several years.

The causes which have formed this mud-bank, and thus afforded by far the safest roadstead in these seas, are, I think, explained by the observations which have been conducted, with much care and intelligence, by Mr. Crawford, the commercial agent of the Travancore Sirkar. The usual explanation is, that the bottom happens to consist of soft mud off Alipee, which is stirred up by the waves of the monsoon. This, however, is quite inadequate to account for all the phenomena of the mud-bank; and I am inclined to believe that the theory formed by Mr. Crawford, after a series of experiments, is the correct one.

During the height of the monsoon the waters of the backwater are 4 feet higher than those of the ocean, and an enormous hydraulic pressure must thus be caused. In the same season, at low water, a series of mud-volcanoes are observed to form on the beach, which eventually burst and disgorge quantities of vegetable matter, and even cocoa-nut stems mixed with mud. On boring to a great depth on the belt of land between the sea and the backwater, the instrument passed through alluvial deposit into apparently moving soft mud, the pressure on the boring instrument being strong to seaward. These facts point to the conclusion that there is a subterraneous communication, through mud, between the backwater and the sea; and that the tremendous pressure at the season when the waters of the backwater are higher than those of the sea, forces an immense mass of mud mixed with vegetable matter, by a subterraneous channel, into the roadstead, where smooth water is thus caused. In this manner Travancore commerce finds a safe outlet. Alipee is approached from the backwater by a canal bordered with houses and cocoa-nut groves, which is crossed by six timber bridges, having streets leading to them at right angles with the canal—a sort of Indian Venice. At the end of the canal is the house of Mr. Crawford, who has long and ably conducted the commercial affairs of the Travancore Government, the custom-house, the great Sirkar timber-yard, and the salt, tobacco, and cardamom godowns. There is also a well-built light-house with a flash-light, and a tramway from the beach to the town. Alipee is now a very important place, and is becoming more so, while Cochin is falling into decay. The whole of the increasing trade of Travancore passes through Alipee, and it has a large trade with Calcutta and Bombay. Cochin, on the other hand, is losing much of its trade, and its ship-building business has been destroyed by the coasting steamers.

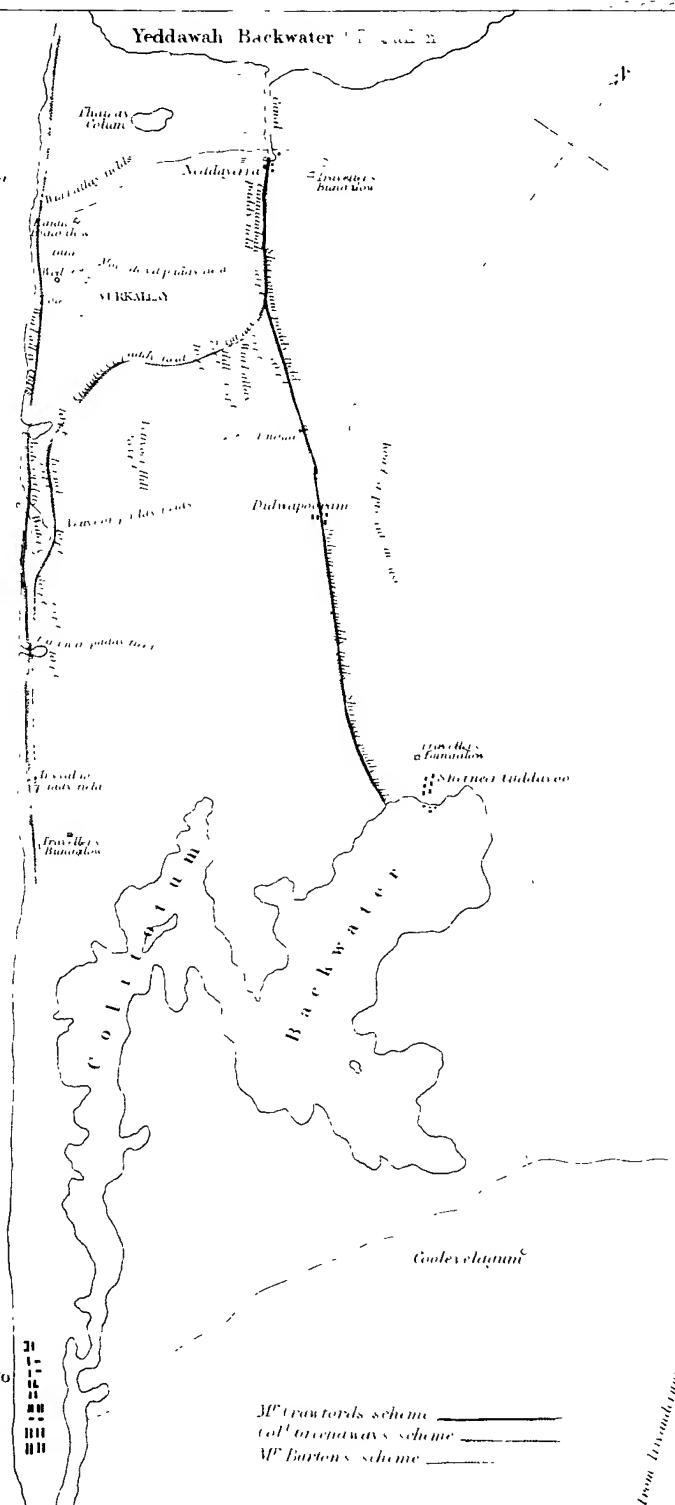
The inland navigation of Travancore is formed by connecting the backwaters by canals. One of these—11½ miles long—from the Channankarry Backwater to Trivanderum, was made by the



# THE WURKALLY BARRIER

to accompany Mr C. R. Markham's paper  
Scale of One Mile

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Mr. Crawford's scheme —————  
Col. Brienaway's scheme - - - - -  
Mr. Barton's scheme . . . . .

from the ground plan



Dewan Vencata Row, between 1823 and 1826, at a cost of 10,712*l*. Others connect Quilon with the backwaters to the north and south, and were executed between 1826 and 1829. These canals are full of shoals deposited from the paddy-fields, and boats drawing 1 foot often have to be dragged over shallows for considerable distances. A small expenditure and more systematic supervision are much wanted. But the grand problem is the Warkallay Barrier, which cuts the inland navigation of Travancore into two sections.

The Warkallay Barrier, immediately to the north of the old English factory of Anjengo, is a spur of the ghauts extending to the sea, and consists of a ridge of laterite hills about 6 miles broad, with a summit-level of 180 feet. The spur ends abruptly in a line of cliffs washed by the sea. The high land is covered with grass and flowering shrubs, such as *Ixoras* and *Osbeckias*, with some crops of gram and other dry cultivation, and a few clumps of jack and mango-trees. On the south side of the spur is the Colitotum, on the north the Yeddawah Backwater. From the Colitotum Backwater a ravine runs up to within half a mile of the summit of the ridge. This ravine is covered with paddy cultivation, called the Sherneer and Dulwapooram fields, and is lined with cocoa-nut trees, jacks, and plantains. From the Yeddawah Backwater a canal is brought up to a place called Neddayerra, where another ravine runs up the Barrier to within half a mile of its highest part. This ravine is also entirely occupied with rice cultivation, called the Cunnumbah and Sherconum fields. An excellent road now crosses the Barrier to the east of these ravines, from Sherneer to Neddayerra; and there are travellers' bungalows at both these places. The cliffs are of soft laterite, and contain a remarkable deposit of lignite. These cliffs are intersected by five ravines covered with paddy cultivation, called, respectively the Warkallay and Moondayll, the Chalacoor, the Vettyoor, the Paramun, and the Aryvaluni fields. These ravines slope down gradually from the higher ridge of the Barrier. The village of Warkallay, containing a pagoda, tank, and Rajah's bungalow, is near the cliffs towards the north end of the Barrier.

There are four distinct plans for cutting through the Warkallay Barrier and, by connecting the Colitotum and Yeddawah backwaters, completing the system of inland navigation in this part of India.

The first of these projects is advocated by Mr. Crawford, of Alipee. He proposes that the Dulwapooram and Sherconum ravines should be formed into regular inclined planes. A stationary engine would then be placed on the summit between the two ravines, working running gear. Loaded boats would be placed on trucks running up and down the inclines on tramways,

and the engine would haul them up one side and lower them down the other, without breaking bulk—thus passing them from Sherneer to the head of the canal at Neddayerra, and *vice versâ*.

The second scheme is that of Colonel Greenaway, the late engineer in Travancore. He proposed to bring a canal along the foot of the cliffs from one backwater to the other by blasting the cliffs back to a distance of 50 feet, and constructing a sea-wall from the débris. This, however, is said to be impracticable. The sea is already washing away the cliffs, and their decay is accelerated by numerous springs in their rear.

The third plan is to make cuttings up the Sherneer and Sherconum ravines, and a tunnel through the hill which divides them. The highest parts of the ravines are 70 feet above the backwater, so that the cutting would have to be that depth.

The fourth plan is recommended by Mr. Barton, the present Travancore engineer, and has been adopted by that Government as likely to lead to the most successful results. He proposes to continue the present canal, on the northern side of the Barrier, from Neddayerra, by making a cutting in the Cunnumbah and Sherconum paddy-fields, nearly to the head of the ravine, where the depth of the cutting would be 50 feet. He would then make a tunnel under the Warkallay Hill, from the Sherconum ravine to that of Chalacoor. The hill consists of sand and clay (full of springs), and rests on a base of limestone; and there will be great difficulties in making this tunnel. The canal will thence be brought by a cutting along the Chalacoor ravine, nearly to the beach. It is then to pass through another tunnel under the Vettyoor Hill to the Vettyoor paddy-fields, where the cliffs cease; and there is no further difficulty in excavating a canal thence to the Colitotum Backwater, close to Anjengo. It will be a very difficult and costly undertaking; but when once completed, it will be of permanent value, for the trade carried along the backwaters is large and increasing.

### XIII.—*Exploration in East Africa between 14° to 16° N. Lat.*

By COUNT C. VON KROCKOW.

THE district which I have explored in East Africa is bounded on the north by the Chor el Gash, on the south by the River Setit, on the west by the River Atbara, and on the east by the land of the wild Bazén.

In 1864-65 I started from Kassala, and travelled southward through the region which in the German maps is designated as the “Land der Schangalla” (Land of the Shangalla). The Arabs call it “Baraka,” or “Barka” (which means lowland).

This area is erroneously described as lowland, it being actually a gradually rising hilly ground, on which grows high parched grass, and in the valleys one occasionally meets with low thorny mimosa and other bushes.

In the accompanying map, which I have sketched, the dotted lines indicate my journey and the routes traversed by me while hunting, the continuous lines point out the constantly flowing waters, ponds and wells, and those waters that only flow during the rainy season in the chors are marked with a broken line.

	Hours.	Geogr. Miles.
From Kassala I travelled s.s.e. through bushes, to the mountain Abu Gamil and Giddir .. .. .	6	3½
Then s.s.e. by s. through parched grass, and over hilly ground .. .. .	6½	4
Again s.s.w. by s. over hills, to the Chor el Gerrada	4½	2½
s.s.w. over hilly rising land with much grass, to the Chor el Gergaf .. .. .	2	1
Through hilly land south, to the Chor Cashmalkirba	5½	2¾
And again south through grass and bush, to the Djebel (mountain) Eshir .. .. .	2½	1½
Through Kakool-trees south, to the Bahr (river) Setit	5	2½
	<hr/> 32	<hr/> 17½

During my hunting excursions I ascended the River Setit east, thence south over rocks by Djirra to the land of Galabat, as far as Matama (12° 40' N. lat.), thence through Guedaref, Hasaballa over the chors Schiderap, Cashmalkirba and Mehka.

Pursuing my journey from Guedaref to Thomat, thence to the village Hager-abiad (White Stone) to the east, I passed through hilly land, on which grew Kakool-trees and grass, to an Homran village, situated about an hour south from the mountain Eshir. From the Abu Gamil (Father of the Camel), the outline of this mountain resembles the hump of a camel. I proceeded over an uninhabitable steppe as far as Mount Eshir. Here I observed only a few gazelles, giraffes and ostriches; no hyænas, vultures or ravens. The thorny mimosa seldom attains a height above eight or nine feet in this land of drought. A rush-like grass grows here, and, occasionally, one remarks a short fine grass; the *cactus speciosa*, too, climbs the bushes.

During the rainy season the Homran Arabs inhabit the higher lands that lie between Tehrat, Romali and Djebel Eshir, where they grow their corn, and find a more salubrious air, thus avoiding the fever that so frequently rages in the lower lands. This tribe is singularly unfruitful; in number they amount to between eight and ten thousand at the utmost.

The map which I have sketched shows that the River Atbara, and not the Chor el Gash (as W. Munzinger states) receives the mass of water that falls in this region during the rainy season.

The hills of this district run nearly parallel with the River Setit, and are, in all probability, the termination of the Abyssinian Mountains; the torrents that washed down from them in the rainy season have gradually broken their way to the deeper lying River Atbara.

From Djebel Eschr to the right bank of the Setit the soil becomes richer, and here flourishes the red-trunked mimosa (Kakool), from this tree gum arabic of the best quality is produced.

The map which I send includes a sketch of an area of 68 to 72 geographical miles in length, and I am satisfied that I am the first European by whom it has been visited. It is true that several maps exist of this district, in which a line running westward indicates the route taken by Mehmet-Beg in 1824, and of Lejean in 1860, but no indication whatever is given of the several chors whose courses I have traced. How the chors escaped the observation of the above-mentioned travellers I am at a loss to say, unless, indeed, they passed them during the night, which is possible.

The Chor Gerrada is the smallest of these, and is from 12 to 14 yards in breadth, and has a depth of from 1 to 2 yards. These chors fall into the Atbara at no great distance from each other.

The questionable Djebel Kosle may possibly be no other than the Djebel Eschr; the geographical position is about the same, and the mountain may formerly have had another name.

Here it may be well to remark that the caravan-routes are not unfrequently changed by the fall of the rain, and thus it often happens that the old roads are no longer traversed by the inhabitants of the country.

I think it may not be amiss to state, in order to avoid a possible misunderstanding that may hereafter arise, that during my stay in Kassala a French Count du Bisson was also there, and he had commissioned a certain E. Wlaszicz to draw a map of the district through which I had just travelled. I saw the production in the month of April, 1865, at Kassala, and drew the attention of the executor of the same to the fact that the map was worthless and entirely false. E. Wlaszicz replied, "The Count du Bisson is determined to have a map of this region: here is one nicely executed; the Count has not travelled himself in this district, and he is satisfied with my map."

I protest against this patchwork, as having no geographical value whatever.

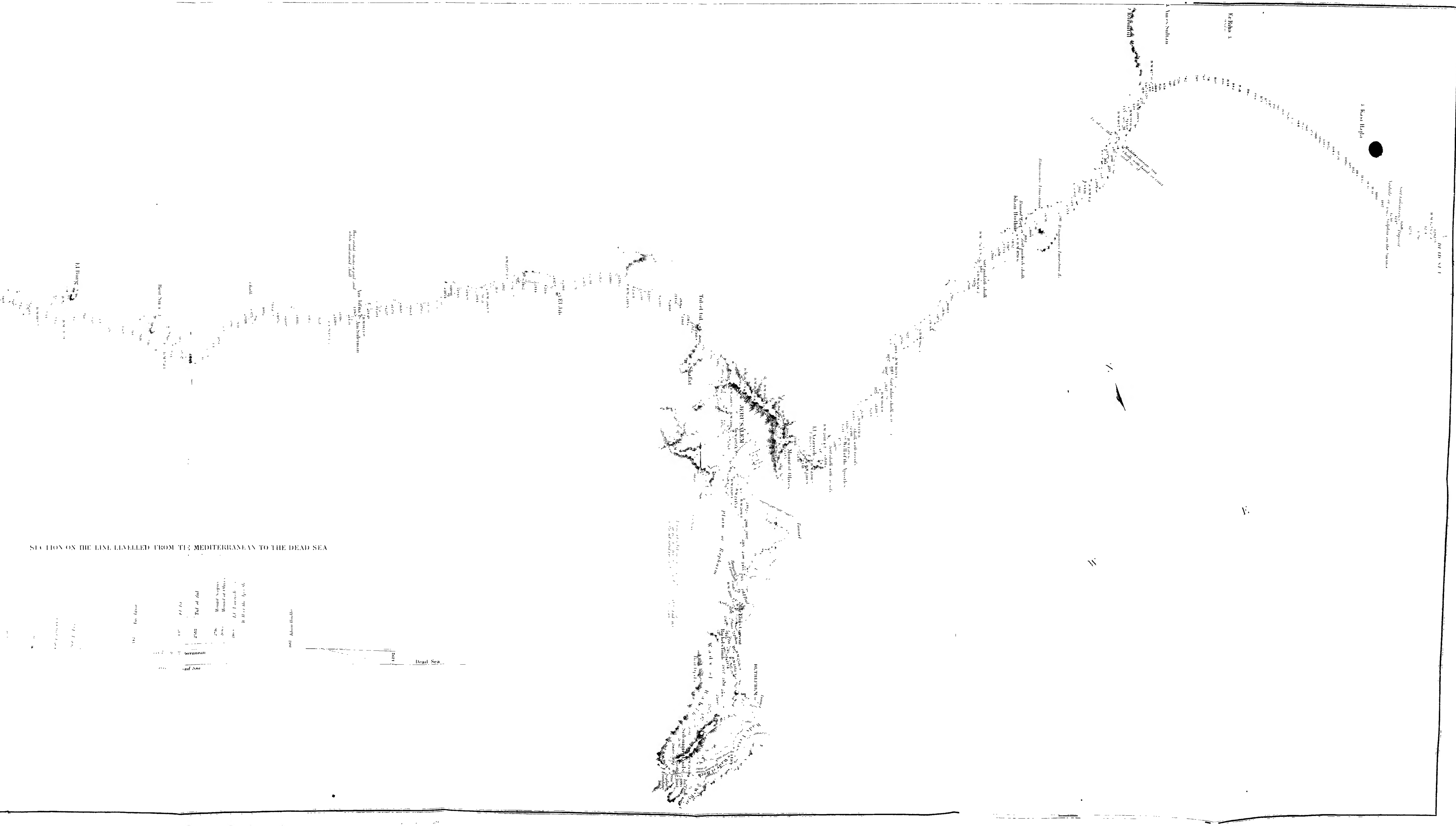
CARL COUNT KROCKOW.

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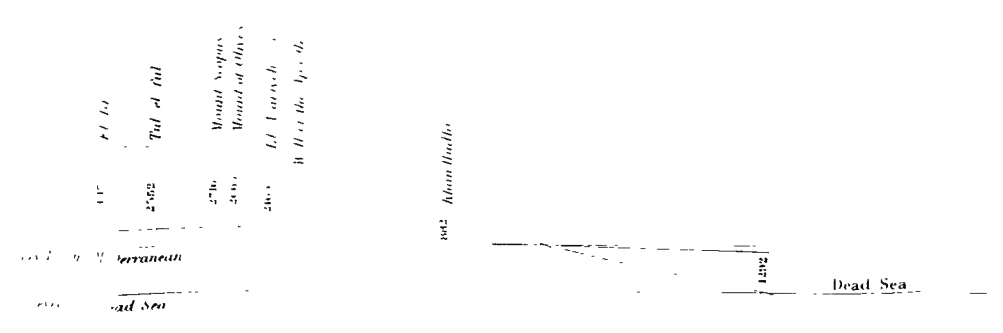


10110 111

Not indicated by the  
level of the water in the  
Mediterranean Sea  
10110 111



SECTION ON THE LINE LEVELLED FROM THE MEDITERRANEAN TO THE DEAD SEA











XIV.—*An Account of the Levelling from the Mediterranean to the Dead Sea, by Captain C. W. Wilson, R.E., and a party of Royal Engineers from the Ordnance Survey. By Colonel SIR HENRY JAMES, R.E., F.R.S.*

THE instructions for levelling from the Mediterranean to the Dead Sea having been received after the party had arrived at Jerusalem, it was thought best to level, in the first place, from Jerusalem to the Dead Sea, during the cool months, and to complete the line to the Mediterranean at Jaffa, when the party were on their way home.

But in describing the line levelled, we may assume that it was made direct from Jaffa to the Dead Sea.

The line selected was that which runs across the maritime plain, direct from Jaffa to Lydda; three miles beyond which, on the road to Beth Horon, the line turns to the right by Jimzu, Birfileeya, and Beit Sira, and from thence up the Wady Suleiman to El Jib; where it again joins the old Roman road from Lydda by Beth Horon to Jerusalem. But at about  $1\frac{1}{2}$  mile on the north road from the Damascus Gate the line turns to the eastward, over Mount Scopus; where it reached the altitude of 2724 feet, the height of the top of the large cairn on it. This was the highest point crossed between the Mediterranean and the Dead Sea.

From Mount Scopus the line follows the high ground to the Mount of Olives, and from thence takes the road down to Bethany, and following the road by Khan Hadhur to near Jericho, the line turns to the right within about a mile of the latter place, and was carried from thence across the plain bordering the Dead Sea to a point opposite a small island in the sea itself (*see Plan*).

Throughout the entire length of this line Bench-marks (⌒) have been cut at intervals, wherever it was practicable, on the fixed rocks, or on permanent objects.

The following is a list of the Bench-marks, with the distances between them:—

LIST of the BENCH-MARKS made in Levelling the Line from the Mediterranean to the Dead Sea in March, May, and June, 1865.

No.	Place.	Distance in Miles and Links	Altitude. feet	Where Cut.	Remarks.
1	Jaffa . . . . .	..	3 800	Castle wall . . . .	On the wall 3 8 feet above level of the Mediterranean.
2	.. . . .	0.1490	31.080	Town wall . . . .	On gate at entrance to town.
3	.. . . .	0.7972	31 2.5	On fountain . . . .	On the fountain near Jaffa.
4	.. . . .	1.5. 11	55 731	On a well . . . .	At West side of road
5	Yazur . . . . .	3.7636	85.4.5	On a well . . . .	At the last end of the village.
6	Bethdagon . . . .	5.5.43	91.435	On a well . . . .	At the West end of the village
7	Sephoneya . . . .	7.3137	126.540	On a wall . . . .	In Sephoneya village, near lone tree.
8	.. . . .	9.6.45	143 630	On a tree . . . .	On a lone tree in maritime plain.

LIST of the BENCH-MARKS—*continued.*

No.	Place.	Distance in Miles and Links	Altitude.	Where Cut.	Remarks.
			feet.		
9	Lydda	11.5022	164.770	Garden wall	At East end of a Lydda village
10	..	14.0659	248.630	West angle of well	½ mile West of Jimzu village
11	Jimzu	14.5194	411.605	On rock	In road at threshing-floor, Jimzu
12	..	15.1714	478.725	On rock	On side of road, top of hill
13	..	15.6495	549.000	On rock	On road, top of hill
14	..	16.284	575.035	On rock	West side of road
15	..	17.0548	517.520	On rock	Side of road and junction of Wady
16	..	18.0479	650.075	On rock	At junction of road to Bufileya
17	..	18.7527	819.180	On rock	Last side of road.
18	..	19.5195	747.865	On rock	On side of road.
19	..	21.7893	751.105	On rock	In centre of road
20	..	25.7849	1157.550	On rock	On side of road.
21	..	26.5121	1251.470	On rock	On side of road.
22	..	27.3592	1423.015	On wall	Corner of garden wall in Wady.
23	..	30.3428	2064.945	On rock	South side of stream.
24	..	30.7617	2358.250	On rock	Lutiane to Wady Suleiman.
25	..	35.5560	2419.505	On rock	East side of road
26	..	37.1670	2681.915	On stone	Near Trigonometrical Station, Jeru- salem Survey.
27	..	37.4078	2685.390	On stone	In centre of road.
28	Mount Scopus	37.6345	2648.545	On rock	In centre of road.
29	..	38.0612	2688.706	On eastern	Last side of road.
30	..	38.1896	2715.795	On rock	Near Gastami Pole.
31	..	38.5086	2662.905	On pillar	On East side of road.
32	..	38.6530	2603.875	On stone	West side of road near junction.
33	Mount Olivet	39.0236	2623.790	On wall	West side of road
34	..	39.1721	2602.500	On rock	Near summit of Mount Olivet
35	..	39.1731	2665.080	Surface	At Trigonometrical Station.
36	Ascension	39.2794	2643.220	On house	South side of road.
37	Bethany	40.2409	2281.825	On rock	Trigonometrical line, Bethany to Scorpion.
38	..	40.4225	2208.755	On rock	Near well, Bethany village.
39	..	41.0148	2018.350	On rock	North side of road at junction of fences.
40	Well of the Apostles	41.6063	1519.615	On wall	Base of Bethany Hill.
41	..	42.2457	1351.845	On rock	South side of road.
42	..	43.1606	1163.050	On rock	South side of road.
43	..	44.0032	1039.145	On rock	North side of road.
44	..	45.0375	902.515	On rock	Near junction of Nebi Musa.
45	..	47.0498	654.190	On stone	Opposite trees in valley.
46	..	47.3127	776.130	On rock	At the top of the hill.
47	Khan Hadhur	48.5296	870.590	On rock	At entrance to cave opposite Khan
48	..	50.2545	537.010	On rock	On side of road.
49	..	51.0706	451.510	On rock	At top of hill.
50	Old Aqueduct	52.7866	-89.715	On rock	On side of road.
51	..	53.5174	-99.035	On rock	On side of road.
52	..	54.0339	-209.890	On rock	North side of road.
53	..	54.4465	-477.045	On rock	In centre of road, opposite house.
54	..	62.2514	-1273.215	On stone	13" Sunk on the beach of the Dead Sea opposite Island.
55	..	62.2965	-1292.135	Level of sea	Height of Dead Sea on the 12th March, 1865.

At the distance of  $3\frac{3}{4}$  miles beyond Khan Hadhur, on the road to Jericho, the level of the Mediterranean was crossed; and from thence towards the Dead Sea the levels are marked with the negative sign.

On the 12th March, 1865, the party reached the Dead Sea, when its level was found to be 1292 feet below the level of the Mediterranean; but from an examination of the drift-wood on the shore it was ascertained that at some time of the year, probably after the winter freshets, the water rises  $2\frac{1}{2}$  feet higher, which would make the least depression 1289.5.

From inquiry amongst the Bedouins and European residents in Palestine it was ascertained that during the early summer the level of the sea falls at least 6 feet below the level at which it stood on the day the levelling was taken, which would make the depression 1298 feet, and we may conclude that the maximum depression at no time exceeds 1300 feet. Lieut. Symonds, R.E., in 1841, made the depression 1312·2 feet.

The soundings in the Dead Sea by Lieut. Vignes of the French Navy, gave a maximum depth of 1148 feet; making the depression of the bottom of the Dead Sea 2446 feet below the level of the Mediterranean.

The soundings in the Mediterranean midway between Malta and Candia by Captain Spratt, R.N., gave a depth of 13,020 feet, or a depression of the bottom five times greater than that of the bottom of the Dead Sea.

The levelling was executed by two independent observers, and from a comparison of the two sets of levelling it is certain that the levels have been obtained with absolute accuracy to within 3 or 4 inches.

The establishment of a chain of levels across the country with Bench-marks cut on so many points cannot but prove of the utmost importance for any future investigations or for any more extended surveys in Palestine, such as are contemplated by the Society which has been formed, since this survey was made, "for the accurate and systematic investigation of the archæology, the topography, the geology and physical geography, &c., of the Holy Land for Biblical illustration."

For the survey of Jerusalem itself it was of the utmost importance, as it enabled us to connect all the levels in and about the city with the level of the Mediterranean, and to harmonise, so to speak, all the levels which have been taken.

XV.—*Journal of an Expedition from the Government Camp, Camden Harbour, to the Southward of the Glenelg River in North-Western Australia.* By R. J. SHOLL, Esq.\*

[Communicated by the Colonial Office.]

*Monday, April 10th, 1865.*—Immediately after leaving the camp we ascended a hill to the south-east. very stony and rocky, yet, as usual, clothed with grass; and for about an hour we

\* See Mr. Martin's Journal of Explorations in the same region, 'Journal Royal Geographical Society,' vol. xxxv. p. 237. No map embodying the recent surveys of the district has yet been received by the Society, but the map in Grey and Lushington's 'Journals of Two Expeditions of Discovery in North-Western Australia' may be consulted with reference to the present memoir.—[ED.]

travelled over country of a similar description, yet with hills gradually decreasing in height. The country was lightly timbered with eucalyptus, cork, and cotton trees, all of small diameter. The hills we passed over might, I conceive, be made passable for carts with very little labour. Everywhere we passed through grass, the country presenting the appearance of a wheat-field, the grass being generally above the horses' bellies, and occasionally even above the heads of the riders. From the summit of the highest hill we had a splendid view of Camden Harbour, with its islands and headlands to our right and rear, with Mount King in the distance to our right and front. The baobab described by Dr. Martin is situated in flat country; and, indeed, after leaving the hills in rear of our camp, we travelled over tolerably level country, occasionally undulating with ironstone gravel, having the appearance of being waterwashed in heavy floods. The ground was in places very soft, and must be boggy during the winter season. I do not consider that we have had a winter, or rather rainy season, this year. About a mile on our course from the marked baobab we passed over several gullies, with quartz scattered among the gravel. After leaving this country we ascended some tolerably elevated ground, from which we saw Mount Lookover, Port George IV., and Augustus Water, in our rear; and Mount King to the south-west. Mount Lyell lay to the south-east of us, and was plainly seen. Passing over the level country we saw several kangaroos. The land was still lightly timbered with eucalyptus, what is here named the cork-tree, cotton-tree, box-tree, and, where the ground was particularly soft, cabbage-palms.

Shortly before our midday halt we commenced crossing the Hampton Downs, which, at this particular spot, was not so well grassed as the country we had previously passed over, but it gradually improved. We encamped at noon, amidst abundance of feed, on the bank of a stream which I thought to be a branch or tributary of the Gairdner River. We had previously passed over a larger stream, with somewhat boggy approaches, and having on its banks, where we crossed, a small thicket of palms, an eucalyptus, with large broad leaves, and other shrubs and trees more vividly green and throwing more shade than is generally found in Western Australia. These streams evidently took their rise in the McDonald range, and ultimately joined the Gairdner. They were shallow, but during the rainy season these, as well as many dry stream-beds which we crossed, must contain a large body of water. The stream upon which we camped was running to the southward. We bivouacked under what is here called the currant-tree, about 9 or 10 feet high, greyish striated bark, with twisted branches. The leaf is bright-green, smooth on the upper surface,

5 inches long, and 1 to  $1\frac{1}{2}$  inch broad. The fruit has a pleasant acid taste—black when ripe. It is of the size of a very small currant, and, like most Australian fruits, has more stone than flesh. It grows in small bunches, the fruit being in different stages of maturity, green, red, and black. The stone or seed is of a flat, oval shape. The branches appear to be adapted for boat-knees, being light and tough. Close by there was another tree, altogether unlike what I have seen elsewhere. It was a tall, rough-barked young tree. The branches do not spread, but take an upward direction, and the leaves spring from the smaller branches in fours. They were pointed, about  $2\frac{1}{2}$  inches long and  $\frac{3}{4}$  inch broad in their widest part, or the centre; they are of a light-green colour. The tree was about 10 inches diameter at the butt, or thickest part. There was also near us the everlasting eucalyptus, with its smooth white stem and branches. The grass at this place was principally kangaroo-grass. More birds were seen on our way than we have met with at the camp. They were principally pigeons, of a brown colour, but not bronze-winged.

Started at 3 o'clock, by which time the sun was less powerful. Our party now consisted of eight, with four packhorses, and we made a track, going in single file, which will last for some time. We steered an east course through Hampton Downs—a well-watered country: creeks, running in the direction of the Gairdner, being crossed every half or three-quarters of an hour. The land was undulating, composed of ironstone, sand, and clay alternately, and occasionally—especially near some of the creeks—of alluvial soil. Whatever the soil might be, there was no lack of grass. In crossing some of the streams, the ground was soft—almost boggy, and at the chosen fording-place of a branch of the Gairdner Mr. McRae's horse was so far bogged as to oblige him to dismount. To the southward of us there was a prominent hill, which the settlers have named Mount Batten, and near it was the elevated termination of a piece of high table-land, looking, until we came closer to it, like a detached hill. They are conspicuous landmarks. We halted for the night on the left bank of the Gairdner, a small stream at this season, with boggy approaches where we crossed it. The banks were fringed with palms. Our halting-place was about 10 miles distant from the camp. During the day I saw more grass than I have seen in any part of Western Australia; most of it kangaroo-grass, and some a reedlike grass, of a coarse nature. Some of the grasses, especially those on swampy land, were sedgy. The day was tolerably cool throughout.

*April 11th.*—Started at 20 minutes to 6, and steered an easterly course for about an hour, and then E. by S. until 9 o'clock, when we again resumed our easterly route to obtain a pass through the hills. All the country passed over was well grassed, and the

soil not so stony as that travelled over yesterday. On the banks and in the immediate neighbourhood of the streams there was rich alluvial soil. About an hour after leaving our halting-place crossed a stream larger than that near which we camped last night. We went over some very soft, boggy ground, and had to pick our way carefully; but these places could be seen and, to a great extent, avoided. Not so with the "dry bogs," as they are termed. The ground is apparently firm—clay, with ironstone gravel—but is completely undermined. The horses plunged continually up to their knees, and no amount of care or circumspection could prevent this. The "dry bogs" were in patches over some four or five miles of country in our course. We skirted Mount Lyell, a two-peaked hill; the distance between either peak being about 1 mile. Halted on the banks of a stream at 10 o'clock, Mount Lyell bearing S.S.E., and distant about 2 miles. We passed through a perfect thicket of reed-grass, growing high above our heads; but generally the pasture consisted of kangaroo-grass, very thick and very high. The horses, when camped in the high grass, generally wandered to feed off less luxuriant growth. Before this country becomes available to its full extent for stock, the long grass will have to be burnt or cut down; it will never be eaten down. It may be trampled down, and allow room for the young grass to spring; but in its present state the feed has no attraction—for horse-stock, at all events. The whole of the land was lightly timbered with broad-leaved gum-trees, cotton, cork, and box trees, all of slight girth. At 9 o'clock we rode up a hill to look at the country. Mount Lyell was to the south of east, and not far off. We had a good view all round, embracing the valleys of the Glenelg and Prince Regent rivers. Our course was through Mr. McRae's run and the Hampton Downs, the greater portion of which are included in this run. The Hampton Downs are all they have been described—well watered and good feed. The stream upon which we were encamped was running through the Glenelg. Mr. Cowle stated our position to be lat.  $15^{\circ} 57'$ , long.  $124^{\circ} 59'$ . Left this place at 3 P.M., and passed through a splendidly-grassed country. The land improved very much, there being less stone and more alluvial. As we neared the Glenelg the trees increased in girth, but they were still scattered. There was no undergrowth of scrub, nothing but grass. We had some difficulty in crossing the numerous watercourses, some of them being very boggy. If we could have seen our way the impediment would not have been heeded, but the thick and high sward of grass concealed everything. We camped for the night on a stream a few miles from the Glenelg, upon a plain of ironstone gravel and quartz, but with the usual abundance of feed. We estimate the distance travelled to be 15 miles. Both peaks of

Mount Lyell were bare, the reddish-brown rock alone being visible. Grass appeared on the slopes, and at the base some light timber. During the day we saw some native plum-trees; the fruit exactly resembles a small plum, larger than a sloe. I was told that the fruit was intensely bitter. I could only secure one plum, and, content with the account given by others, did not taste it.

*April 12th.*—Had a sleepless night, the mosquitoes being on the *qui vire* until daylight. We proceeded towards the Glenelg, steering about due south, as indeed we had done from our halting-place at noon yesterday. Crossed several streams flowing towards the Glenelg, which were more difficult to pass than those farther north, the grass being higher and thicker, and the stream-beds more soft. Mr. McRae, however, was a first-rate pioneer, and, after some trouble, we arrived on the banks of the Glenelg, at a spot where it was divided into two branches; both united lower down, leaving a small island between the two. This we followed for a about half a mile, when we came to some rapids; and at this spot the stream we struck was united to the main branch. The united streams were about 60 yards wide; but in the rainy season the river must be of considerable size, as there was abundant evidence of the flow of a large body of water. The soil on the bank is alluvial, in the bed of the river sandy and rocky. We crossed at the rapids without wetting our feet—the water was not, in fact, above the horses' knees—and then proceeded south for about half a mile, where I determined to form my permanent depôt on the banks of a stream running into the Glenelg, with abundance of feed, plenty of firewood, sufficient shade, and, in fact, all that we require for the purpose. Our small tent was placed facing the south—our destined course—where at the distance of about a mile rise the Wheatley Hills. We arrived at this spot at 10 A.M. The country is generally gravelly, with occasional outcroppings of rock, and here and there patches of alluvial soil. There was no difference either in the character or quantity of the grass, while the trees and shrubs were of the same description as those we had passed before, except that at the Glenelg we again met with the baobab, though not of so large a size as those near our camp. On the banks of the river were paper-bark trees, lofty but of no great girth, the thickest not being more than 10 or 12 inches diameter. The foliage was similar in shape to that of the eucalypti, and possessed the same aromatic flavour. There were also some trees of moderate height, more umbrageous than the generality of Australian trees. They had a rough blackish bark, the leaves were dark and large, the trees bore a fruit not in shape unlike a large white-heart strawberry, of a yellow-white colour. The settlers called it the mulberry-tree, and say the fruit when ripe is not unpleasant. What I tasted were acrid. Between



our dépôt-camp and the Glenelg we started a kangaroo, and on the banks of the river saw a flock of black cockatoos, apparently similar to those farther south. At our own dépôt the hawks, which swarm to such an extent at Government Camp, began to collect. There were a few sand-flies and mosquitoes, but not swarming, as they did at our bivouac the night before. Cool day.

*April 13th.*—At a little before 7 A.M. Mr. Cowle and myself, accompanied by Messrs. McRae, Hindhaugh, Hick, and the native Billy, started on our first exploratory trip in the Ranges. We followed up the gully on which we were encamped for about an hour and a half, our course being easterly, with a little southing. The country was generally rough and occasionally boggy. Crossed the stream-bed more than once, the fords being boulders of slippery rock, over which the waters dashed. At its source we finally left the stream and vainly attempted to make south, but the hills, for the most part precipitous sandstone elevations, barred our progress. We dismounted and walked up one of the hills, leaving Billy in charge of the horses. The hill was of sandstone, with trap or basalt at the base. From the summit the country looked very rugged, especially in our course—south—the hills being tumbled together without any regard to arrangement, while the valleys were as rock-strewn as the hills. On this hill was a solitary pine—we had previously seen a few. It was not large, being from 12 to 15 inches diameter, and of moderate height. Descending, we tried our best to round the hills, but were baffled by the fearful country. Following on every occasion every valley which trended anywhere near our course, we were continually driven back by insurmountable barriers of rock. The valleys, in fact, were for the most part ravines, or ended in ravines; the hills coming down on either side, and allowing but a few feet of level country, if it can be called level where masses of rock of every conceivable size, shape, and angle, are strewn over the narrow path. The poor horses were tumbling, jumping, and sliding every minute, their legs and feet bleeding from the sharp rocks. After all this labour, towards midday we found ourselves not more than 5 miles from dépôt, with no prospect of getting farther south in this direction. Before our noon-halt we tried to make the Glenelg by starting north and east, but failing. bivouacked in a small grass-flat surrounded by rocks, with a streamlet flowing through the centre. We passed along several of these flats during our morning journey. They were generally well grassed, and the soil was red loam, but they were all of very limited extent. Grass as usual was abundant in the most stony portions, and I only saw spinifex among the crevices of the otherwise bare blocks of sandstone. Starting at a quarter to 2 P.M. we pursued a generally north route, sometimes a little to the east or west, according to the course of

the ravines. We were now gradually descending, having during the former part of the day been going up-hill—sometimes imperceptibly, at others 30 and 40 feet in the course of a hundred yards. We passed through masses of sandstone, assuming fantastic shapes and forms, requiring but little effort of the imagination to give them “a local habitation and a name.” One plot of rock-scattered ground bore a marked resemblance to a ruined churchyard. The broken headstone, the dilapidated monument, the shivered pillar and fragments of sepulchral architecture—all were there, while some of the blocks were sharp in outline, and perfect as if they had just left the stone-cutter’s yard. At half-past 2, although we had since our noontide halt been travelling downwards, we were still on very high ground, with the River Glenelg some hundred feet below us, the descent being a perpendicular wall of rock; on the opposite side were hills of equal height and of equal steepness. Here there were rapids. The course of the river was north and south, taking, shortly from the spot where we were stationed, a turn to the eastward, and afterwards a south-east direction. As there was no chance of descending to the river at this spot, we followed a course a little to the eastward of north, and travelling down a ravine, the most steep, the most rugged, and the most lengthy of any we had hitherto travelled, and which punished the horses very severely, we emerged upon the level country south of the Glenelg, and struck that river about a quarter of a mile above the rapids which we crossed yesterday, and about two miles below the spot where its course was from south to north. At these rapids its direction was westerly. From the rapids we proceeded to the *dépôt*-camp, which we reached at 5 o’clock. My companions stated that the country was more rugged than any they had previously passed over, and they had all more or less had some experience of rough land: one of them, indeed, had travelled through the elevated Gipp’s Land territory. If our journey was fatiguing it was not otherwise unpleasant. The day was fine and cool; we had abundance of water: the scenery was not only novel, but extremely picturesque and often magnificent. A good bathe in the *dépôt* creek soon restored energy and strength, and without being damped by our non-success, we discussed the probable proceedings of the morrow. Seeing the impossibility of penetrating the ranges in the direction we had pursued, we resolved to take a south-westerly course as far as practicable.

*April 14th.*—A fine morning, but the flies, as usual, very troublesome. We went round the west end of Wheatly Range, travelling through more rugged country than even yesterday, but there was not so much of it. We wandered about for some little time, striving to penetrate through the hills, and struck the river, pursuing a course a little to the northward of east. The Glenelg

was here running south. The cliffs came down to the water's edge on either side, and we had not gone far along the bank before our way was stopped. We therefore pushed up the range, following the ravines and valleys, and steering south wherever we had a chance. The country was in every respect similar to that which we traversed yesterday, except that the valleys were not so well grassed, and there was more spinifex. After clearing the hills we passed over some tolerably level table-land, sandy, and thinly grassed, and at half-past 11 struck a large stream, which we took at first for the Glenelg, but, as it was flowing north, it was evidently a tributary. This stream I named, subject to the Governor's approval, the McRae, after one of my companions, a gentleman who had been of signal service to us throughout the expedition. The river, where we struck it, was  $82\frac{1}{2}$  yards wide from bank to bank, but the actual stream of water did not exceed 20 yards, or, at the furthest, 25 yards. On a ledge of rock overhanging the river, we bivouacked; the horses looking at, but not touching, the spinifex. A spring of water burst from the rock, and formed a small stream, from whence we got a supply for ourselves and horses. On either side the rocks lined the river, but the hills were of no very great height. Among the plants in the neighbourhood I noticed the hollyhock—very similar to our own in leaf and flower; and the honeysuckle, red and white flowers, but scentless. The trees here, and in fact throughout the ranges where we have been, are eucalypti, casuarina, acacia, cotton, cork, box, and palms. Also some trees bearing a fruit resembling in appearance, when ripe, a russet apple, and, when unripe, a smooth green apple. It was intensely bitter, and contained a large stone—in fact, it was nearly all stone. There were some splendid lilies in the river, which emitted a perfume like the violet. They were of different colours—white, pink, and blue—the two latter light tints, as if the original white had been stained with colour. The river must rise in the ranges which we see to the southward, and will most probably furnish a pass through them. We could not, however, proceed in that direction to-day, in consequence of Mr. Cowle's horse having cut his leg too severely to travel. In fact, all our horses were more or less maimed. We started a kangaroo, but with so large a party it is next to impossible to get near enough to have a shot. On our return route we took a north-easterly course, following down a brook which we crossed on our outward trip, and which was descended by our horses with very great difficulty, owing to the steepness and rocky nature of its bed. Before arriving at this brook we crossed the sandy table-land of our outward track, above a mile to the southward and eastward, and found it thinly clothed with grass. We passed the Wheatly Range (by following the

before-named brook) to the westward of a detached hill on the eastern point of the mountains. We left the McRae at 2 o'clock, and arrived at depôt camp at half-past 3. All the flat lands over which we have passed—and they are not many, and limited in extent—possess a soil of either sand or ironstone gravel, sometimes of both. The great peculiarity here, as well as in the land to the north of the Glenelg, is the total absence of undergrowth bushes; between the widely separated thin and short trees there is nothing but grass and creepers. Let it be thin or thick, good or bad, tall or short, still it is grass. The trees were generally of small girth; the largest we have yet seen did not exceed 15 inches diameter, and trees of this size were very rare. The baobab-trees of course are exceptions, for they, on the other hand, are of enormous circumference; but after leaving the tree named in my first day's journal, we did not see another until we came to the Glenelg, and then we met with a few. There is one or two near our depôt camp. They are an unfailing sign of water—not necessarily surface water, but of water at a short distance from the surface. They are more plentiful near the government camp than I have seen elsewhere. Looking through the opening at the back of my tent, I see two as I am now writing, of noble girth, but not so large as others. Between the camp and the well, and along the now dry bed of the watercourse which supplied us when we first landed, and until lately, there were several, and this makes me the more confident that there will be no great difficulty in obtaining water at the driest season. The palms are generally indicative of surface water, and grow in soft swampy land, and upon the margins of rivers and streams. In travelling along, whenever we saw palms in our course, we prepared to flounder through soft or boggy ground, and in nine cases out of ten the ground was either the one or the other. The sandstones in the ranges have every variety of size, form, and colour. From blocks weighing hundreds of tons to pieces weighing a few grains; in shape, columnar, tabular, pyramidal, in pavement blocks, like gigantic walls, with every line separating each block, as level and as closely cut as if placed there by human agency, like ruined castles, with towers and battlements—half defined and half defaced, massive boulders, and pebbles of the size of marbles; lying in every attitude, presenting angles in every possible position, they seemed like the remains of cities built by giants, and scattered abroad in some great convulsion of nature. The hues of the rock are varied to a degree—dark brown, light brown, yellowish brown, yellow, white, red of different shades: sometimes several colours in the same rock. Again, while many rocks are clothed with grass, others are quite bare. We have thus anything but monotony among the ranges. Owing to the cause before stated, we could

not make a good day's work, and our extreme distance south was not more than three miles, but the horses were nevertheless much bruised, and cut about the legs, and seemed to have had enough of it; so I determined to halt to-morrow (Saturday), and, as a matter of course, on the succeeding day, and then make a three days' trip, as there appears at last to be a chance of making some southing. We had a tolerably cool day, and in fact when we got among the hills the change of temperature for the better was invariably marked. Upon examining the map, it would appear either that we are not on the rapids named by Grey (at the spot where the river bends to the southward), or that the Wheatly Range, or the river itself, is incorrectly laid down. Our *dépôt* camp is about three-quarters of a mile south-west of the rapids, and the range faces us about half a mile, or from that to a mile distant, its position being east and west. To the eastward, half a mile's travelling brings us to the eastern end of the small detached hill round which we passed on our return trip this morning, and by going a mile to the westward, we came round the western point of the range. From a mile and three-quarters to two miles is the extent of the range facing us to the south, neither end of which, east or west, is distant more than a mile from the River Glenelg. According to the map, our present position is two miles to the eastward of the range, or in fact on the opposite bank of the Glenelg. We are on a peninsula, hemmed in by the river on every side, except south, with a point or two east or west of south; and such a peninsula! except the flat upon which we are encamped, which extends back to the rapids, and up and down the river for a limited extent, the country is one mass of sandstones, of more or less elevation. Mr. Cowle informed me that he was not yet perfectly satisfied of our exact position, but he was inclined to believe that we were not on the rapids described by Grey. We saw no marked trees, nor any other sign of Grey's party.

*April 15th.*—To-day was the hottest we have experienced since leaving Camden Harbour, the weather having been generally cool—much cooler than I have experienced it at Government Camp. We have also had some heavy dews at night—a very rare occurrence at camp. The festering sores which afflicted so many in camp are also fast disappearing. Saw to-day a beautiful water-lily growing in a different part of the creek upon which we are encamped. It was sweet scented; the flower was large, white-edged, with a fringe of light blue; and under the surface was blue, of a darker tint.

*April 16th.*—Remained in *dépôt* all day. Hawks swarming about the place in hundreds. Not a thing could be left for an instant but it was pounced upon, and, if at all eatable, carried away. Wherever we go, one or two accompany us; and no

sooner are fires lit, and preparations made for meals, than they come from all quarters. They are brown birds, about the size of a small fowl. They are fearless, and stand to be shot at, not moving, though the revolver-bullets strike the branch upon which they are perched within an inch of their bodies. Bathed in a pool of water a few hundred yards down our creek—a pleasant place, surrounded by palms, the only approach to tropical vegetation which I have seen.

*April 17th.*—We all had a tolerable night's rest, and started at 20 minutes to 7 A.M. on our journey. The party consisted, besides myself, of Mr. Cowle, who is somewhat better this morning, Mr. McRae, Mr. Hick, and Billy. We took three days' provisions. The day was fine, but calm. Found a much better pass to the eastward of the Wheatly Range than the one we travelled on Friday, on our return route, by following up a creek. At half-past 8 arrived at a spot a quarter of a mile north of our bivouac on Friday, travelling over comparatively easy country, tolerably well grassed. From this place we attempted to get south by following creeks, but did not make more than half a mile in a direct line by 10 o'clock, when we were brought up by a creek, with rocks to the water's edge on either side, and a barrier of rocks in the centre, over and among which the water tumbled very prettily. A fringe of palms skirting the stream added to its picturesque appearance. Mr. Hick shot two white cockatoos, somewhat different from those I had seen at Camden Harbour. The topknot was white, and the feathers under the wings light yellow. At Camden Harbour the topknot is sulphur-coloured. Got, near our halting-place, some berries, not unlike, in appearance, black currants. They grew on a tree, not dissimilar in height and appearance to the one described as being at our noontide halting-place on the 10th instant. The fruit, however, was different, larger, and growing on stalks—not in bunches; the leaves were light-green, smooth, 4 inches long, and  $1\frac{1}{2}$  inch broad. They call it the elder-tree, but there is not much similitude. Around the camp I marked some smooth-barked white gum-trees, larger than any we have before seen—about 18 inches in diameter. Walked out with Messrs. Cowle and McRae to have a look at the country to the southward and westward. We went about a mile, and found, with the exception of some rocks near the camp, that the course, for this country, was fair travelling. Mr. McRae and myself climbed up two hills, Mr. Cowle being too unwell to make the attempt. We found the appearance of the country to the southward promising, but due south the ranges seemed to bar our progress. The Wheatly Range was beneath us to the north, and we could see over it the hills on the other side of the Glenelg. On one of the hills which we ascended there was a cave, in which

were the remains of a native fire—apparently one native. It was recent—that is to say, about ten days or a fortnight old—the ashes not having been either much disturbed by the wind or intermixed with dust and droppings from the roof the cave. We saw the McDonald ranges in the distance, and also Mount Lyell, far away from and beneath us. We estimated our height above the sea-level at 1800 feet. On our return picked up a piece of stone which the natives had been sharpening for their spears and knives, &c. It is something like obsidian, but not so highly glazed. The hills which we climbed were sandstone, with trap or basalt at the bases and in the valleys. The trap-rock was intersected by veins of quartz, and there was a peculiar outcropping of that stone in small spiculæ and large crystals. The ground at the base of the hills was strewn with the débris of quartz, some of it as fine as sand.

*April 18th.*—Left camp at half-past 7. Crossed numerous creeks and streams; this country is beautifully watered, and, steering s.w., at half-past 8 struck the McRae. At this spot it consisted of large reaches, bordered by palms and lofty paper-bark trees. The reaches were connected by narrow channels formed by the hills descending on either side. These channels were rock-strewn, and the water passed over between the rocks, either in the form of cascades or rapids, according to the height. We crossed the McRae at one of the rapids, and followed it up, the stream running about N.N.E., we of course steering in an opposite direction. The travelling became very difficult; the hills were often perpendicular, like walls of masonry, for in many places even the joints are distinctly marked, always precipitous. Our course was at the base; and when the ledge of rocks over which we travelled sloped off to the water's edge, we had to cross the stream the best way we could, and make our way along the opposite side until similar impediments compelled us again to ford the river, which we crossed and recrossed five times. Some of these fords were difficult, owing to the masses of rock of all shapes, over whose slippery points and surfaces the horses stumbled, and sometimes fell, but happily no accident happened to horse or rider. At one place we were blocked in on both sides, and had nothing for it but ascending the bank. We were at the time on the right side of the McRae, and luckily the hill was not so steep as its neighbours. It was, however, quite steep enough—something like Mount Eliza, at the back of my former residence, but not so high. We dismounted and led our horses, not going straight up the ascent, but twisting and turning among the large stones, and thus saving the animals an additional pull. Halting on the summit of the hill to breathe ourselves and horses for 10 minutes or so, we pursued our journey. By the river's side I noticed a peculiar-looking tree, the only one

of the sort that I observed during our journey. It was larger than its companions, and looked more like an English forest-tree than any I have seen in Australia. It was richly clothed with dark foliage, threw out long and spreading branches, and was a complete shade-giver. The leaves somewhat resemble the myrtle. The soil of the country over which we passed was sandy near the river, in patches between the rocks, and reddish brown upon the hills; but rocks and stones were everywhere, and grass of course. We have never been without grass—much of it coarse and rank, but most of it sweet and good. Saw some yellow-crested cockatoos near the hill which we had just climbed. The descent on the other side was not so abrupt, and we had no occasion to dismount. Passing over some level bare rocks, with here and there ledges from half a foot to a foot high, we were again brought to a halt at some rapids, which appeared difficult to cross, while our progress was barred by a wall of rocks, with no convenient shelf wide enough for our horses. In some still water a short distance from the rapids there were beautiful water-lilies—white, with edges fringed with filaments like feathers or down. The flower was five-petaled, small, and inodorous. With some splashing and slipping, we crossed the rapids, and, ascending a stony hill of moderate height, came along some tolerably level country for about a quarter of a mile. Here I observed for the first time, though it afterwards appeared that it was—if not plentiful—pretty generally dispersed, a fruit-bearing plant, about  $2\frac{1}{2}$  feet high. There are two stems springing distinct from each other, the shorter one about one foot long, bearing a leaf which resembles somewhat the potato-plant; the longer one, 2 feet, bears the fruit in three pendulous seed-vessels, in shape like the English gooseberry, and enclosing a large number of striated seeds, enclosed in a sweetish pulp, the flavour being more grateful than most of the so-termed edible fruits of the country. The colour of the ripe seed-vessel is a rich sugar-brown. It exudes saccharine matter, and is sticky and clammy. I picked a specimen, root, stalks, leaves, and fruit; and also collected some fruit, which became crushed, and afterwards fermented in my haversack, but I managed to save the seed. When I arrived home, my son produced some specimens he had collected in the immediate neighbourhood of the camp; so it was no novelty, after all. Almost immediately after passing these plants, we came to a patch of baobab-trees, the first I had seen since leaving the Glenelg. Still following the course of the Glenelg—we were now on the left bank—we crossed again at some rapids, and, ascending a bank of moderate elevation and steepness, proceeded along some richly-grassed table-land—clayey soil, with stones intermixed—until gradually nearing the water's edge, the accustomed rocky bar compelled us once more to cross the river.



Travelled over some bare rocky ground, full of ledges and fissures, and, coming to a grassy flat, we camped at noon in its midst, among a clump of short trees, sufficiently close together to throw a grateful shade. Our halting-ground was about 80 yards from the McRae, distant from our sleeping-camp 7 miles, and from the depôt (due south) 9 miles. Our course has been rather to the westward of south. While at dinner a hawk, more bold than his companions—and none of them are too modest—pounced down among the trees, and was easily caught by one of the party, and, after due examination, let go. Messrs. McRae and Hicks ascended a hill to the westward of our camp, and reported that the country looked clear in the direction of our course, but said there was a range running north and south to the eastward. We left camp at 3 P.M., and following up the river shortly afterwards, passed through a very small patch of thicket, with climbing-plants crossing from tree to tree, obliging us to cut our way. The soil was alluvial, and very soft. Here I saw ferns for the first time—a delicate feathery-leaved plant. After emerging from this thicket, we travelled over undulating country, gradually ascending in our course, which was now due south. The flat through which we now passed was bounded east and west by hills rising like walls, with occasional valleys between, of apparently similar flat land. The distance between the hills on either side was at first but a few yards, but this gradually extended, and the average width of the plain during the 6 miles we went over it was almost, if not quite, half a mile. It was splendidly grassed, and the herbage was thinner and less rank than on the north side of the Glenelg, and more fitted for the immediate use of stock. The soil was generally gravelly, sometimes sandy, and occasionally rich loam. Judging by the habits and tastes of our horses, I should prefer taking up land of this description for stock to the more densely-grassed country contained in Mr. McRae's run; but this was comparatively a small patch, although the valleys running at right angles on either side, as well as many of the hills, seemed equally well grassed. The McRae had now dwindled into a creek, no longer broken into wide reaches; and after following it along the valleys, it branched off, one stream coming from the westward and the other from the southward. The latter we considered the main stream, and, as it was in our course, continued to follow it up through rocky country. After travelling about 3 miles among our old friends the sandstones, we camped for the night in a narrow valley, through which the McRae, a small but still running stream, flowed, and which was fairly grassed. The hills on either side are not high, and the horses relished the grass, which was short and sweet. Noticed the banksia-tree on the banks of the McRae, not having seen it north of the Glenelg. It is short and scrubby, and seems

out of its latitude. It is apparently peculiar to the McRae. Several kangaroos were started during our day's march. Mr. Cowle informed me that we were 2500 feet above the sea-level. I should not have thought so; but as we have been ascending, generally gradually, and sometimes abruptly, since we left the Glenelg, I suppose it must be so. We had now come about 19 miles south of our *dépôt*-camp; and as there is nothing to prevent the movement of pack-horses, while there is some prospect of our proceeding still further south, I determined to shift the *dépôt*-camp, in furtherance of my slow and sure plan of feeling the way in front, and being able to calculate as nearly as possible how long it would take to remove the party back on our tracks through a country which offered no serious impediment, now that we had discovered passes through the hills, to tired and jaded horses. Mr. Cowle places our present camp in about latitude  $16^{\circ}$  s.

*April 19th.*—Up at 10 minutes past 5, after a cool and refreshing night, and started at a quarter past 7. We passed yesterday's shady bivouac at 9. Noticed in the country we passed over some scrubby stunted cypress, which also grew in the neighbourhood of Camden Harbour. It is not however plentiful, nor is it useful for any purpose, being a mere bush. The box-tree and the cotton-tree very plentiful here and throughout our line of route, the former a very hard and the latter a very soft wood. Got to the flat, where we slept, on Monday at 20 minutes past 12. Left at 3 P.M. and got back to the *dépôt* at a quarter past 5, travelling back on our tracks with good speed. Resolved to rest our horses until Friday, and then move on.

*April 21st.*—Did not start until 8 o'clock. Proceeded to our sleeping-camp of Monday and had to halt, my horse having twisted off its off hind-shoe in the ranges. Noticed more particularly at this spot the native apple-trees. They were loaded with fruit, about the size of a small apple, and which I have formerly described. The tree is about 30 feet high, the stem 6 inches diameter; bark dark brown, lying in flakes; leaves in pairs, eight pairs being on one stalk, of a light-green colour, narrow and pointed at the end, about  $2\frac{1}{2}$  inches long and 1 inch wide in the broadest part; the stalk upon which the leaves are placed 15 inches long. The shrub called the sand-paper plant is also here, as well as at Camden Harbour. The leaves are dark green, with a rough upper surface, like fine sand-paper; they are dry and crisp, but not brittle or easily broken. The leaves grow in pairs, upon a stem rising from the ground about 4 feet high. They are  $3\frac{1}{2}$  inches long and 2 inches wide, and nearly oval. There were trees in our neighbourhood, the stem clothed with brown stringy bark, the branches white and smooth, like the ordinary white gum of the country,

and the leaves were also precisely similar. It presented a very strange appearance, but my companions recognised it as the "Gum-top Stringy-bark" of Victoria. A graceful-looking tree close by attracted my attention. It was 40 feet high, the stem 4 inches in diameter, leaves dark yellowish green, 6 inches long,  $2\frac{1}{2}$  inches wide, thick, and rounded at the apex. Started from this camp at a quarter past 2, and at 5 o'clock halted on the right bank of the McRae, in splendid feed of kangaroo-grass up to the horses' bellies. We were on a small flat containing about 100 acres of this feed, which grew on clayey soil, and our camp is fixed in a clump of young trees about 60 or 70 yards from the river's bank. The river flows from south to north, and here forms the arc of a bow, which encloses our flat. On the opposite or west side of the stream the sandstone-hills rise to a great height, sinking lower towards the south.

*April 22nd.*—At 9 o'clock this morning we arrived at our destination, the junction of the two creeks. Resolved to halt here until noonday, and then push on a flying party to the southward. We are on a rocky piece of ground, with the McRae, now a mere brook, running close by. About our camp lizards of every size and colour sport among the rocks.

*April 23rd.*—There was a cool breeze from the southward this morning, but the sun's rays were very powerful. We have lost mosquitoes, sandflies, and other flies, but the ticks are very troublesome, crawling about in every direction, and much annoying the horses. Six or seven are cut out of our nags at one time. The hawks still accompany us, and one was caught by hand. When laid down he stretched his legs, shut his eyes, and was to all appearance—what he intended us to believe—dead. Upon moving a step or two back, he raised his head, and seeing that simulating death would not do, commenced pecking at the finger of his captor, who had approached again towards him. When he saw that there was no one nearer to him than a few yards, he leisurely flew a short distance off. Bathed in a narrow reach of the McRae, but without much comfort, the bottom being composed of sharp-pointed rocks, the water hot, and leeches in great numbers. Leeches were not met with in the Glenelg, nor do we hear of their having been seen in the neighbourhood of Camden Harbour. They seem to be peculiar to the McRae, as far as my experience goes. Mr. Cowle makes the latitude of our camp  $15^{\circ} 59' 8''$ .

*April 24th.*—Started at a quarter past 7 upon our exploring trip. We took with us three days' provisions, intending, unless compelled to return in consequence of losing shoes, to be away from camp for that period. Arrived at our halting-place of Tuesday last at 8 A.M., and continuing to ascend the valley for about half a mile farther on, we reached the summit of the range

up which we had been travelling since we left the Glenelg. Here we dismounted, and leaving the horses in Billy's charge, climbed up the highest hill, which had an elevation of about 100 feet above the valley, and may be considered the highest point of this part of the range. The view was extensive, and the following bearings were taken by Mr. Cowle and entered in my note-book at the time:—A hill w. by n., distant about 9 miles, apparently sandy, was supposed at the time to be the Red Cone Hill, near Doubtful Bay, but this cannot be, as, upon reference to the map, that hill appears to the southward of our position. The one we saw is a remarkable hill, and easy of identification; Mount Lyell n. by w.  $\frac{1}{2}$  w.,\* about 20 miles; Mount Double Cone n.w. by n., 25 miles; a table hill n.  $\frac{3}{4}$  E., about 35 miles. This we conjectured to be Mount Waterloo. In our course there were three distinct ranges of hills, all of which seemed to be much lower than the one we were on. Their course averaged east and west. The nearest and smallest range was distant about 5 miles; the second, somewhat higher, about 10 miles; and the third, the highest, which looked blue in the distance, not less than 25 miles. The country between us and the nearest range appeared practicable. Mr. Cowle considered that we were now 3000 feet above the level of the sea. As this is the highest point of the range in this direction, and the spot is prominent, I give it a name, and propose, with the Governor's consent, to call the hill Mount Cowle. Descending the hill, we remounted our horses and proceeded over the crest of the range. Immediately after leaving the source of the McRae on one side, flowing north, we struck the head of another creek on the southern side, and flowing south. This we followed over very rugged country (the country, by the by, which looked practicable from the hill-top) for about 2 miles, when we were stopped by a complete block of rocks before and on either side of us. We had for some time been driven into the stream, there being no passage on either side, and had made our way with difficulty among large boulders of rock. The stream had increased rapidly in width, depth, and volume, and though so near its source, was larger than the McRae, at our second depôt. Mr. Hindhaugh went ahead a short distance on foot to see whether there was any chance of our getting along by another route, and on his return reported that the country was impassable for horses. He had gone down the rivulet for about a quarter of a mile, when it was joined by a larger stream, and the united waters flowed towards the westward. It would most probably be joined by numerous creeks from this and the next parallel range, and by the time it reached the sea

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\* [According to the tracing subsequently furnished by Mr. Cowle, Mount Lyell is placed a point or two to the eastward of north from Mount Cowle.—R. J. S.]

coast have become a river of some magnitude. I think it not improbable that, in the valley between either of the ranges which we saw from Mount Cowle, a stream of more or less magnitude flows towards the sea. We retraced our steps, leading our horses over the worst portions of the ravine in which we were confined, and encamped higher up the creek at 10 minutes to 12. The latitude, by observation, of our camping-ground, was  $16^{\circ} 2'$  and some odd seconds, our farthest south being as nearly as possible  $16^{\circ} 3'$ . Mr. Cowle made the longitude of our halting-place  $124^{\circ} 55'$  E. It was a pretty spot, overhung by sandstone cliffs, between which the stream rushed over the rocks. On a ledge of rock some 10 or 12 feet above the water we boiled the water for tea, the horses feeding higher up the valley, where there was a diminutive flat. Between the fissures of the rocks a sufficient number of trees flourished to throw a grateful shade, some of which I had not noticed before. There was one light grey-barked tree, with dark-green leaves, pointed,  $2\frac{1}{2}$  inches long by 2 broad, with a fruit somewhat resembling the seed-vessels of the rose, which, when ripe, were of a dark-red colour. They were sweet to the taste, and grew upon a short stalk in clusters of 6 or 8. Mr. Hindhaugh brought in a sample of a narrow-leaved palm, the leaves diminishing in breadth from half an inch to the thickness of a thread; they were fine and tough, and seemed well adapted for the manufacture of hats, and when prepared, of cordage. I did not see the palm itself, nor were any more seen by Mr. Hindhaugh, except a few in the locality where he procured this specimen. I blazed some saplings at this place, from which exuded a large quantity of white viscid fluid, which turned dark on exposure to the light, looking not unlike india-rubber. One of the trees was marked by Mr. Hindhaugh J. H., his initials, and these marks may serve to identify the spot at some future time. The lizards were very plentiful on the rocks, and they seemed to be of the same colour as the particular mass of rock on which they sported—the various shades of brown and yellow. They were most expert fly-catchers. Resumed our retrograde march at 3 o'clock, it being my determination to return to depôt, there appearing to be no opening in this direction, and follow the branch of the McRae, which came from the westward, hoping to find an outlet to the southward. We had not gone more than a mile when Mr. Cowle's horse lost a shoe, and we halted while Mr. Hindhaugh shod the animal. Our last nail was thus consumed, and, recollecting the nature of the country we had to pass on our way home, and knowing how utterly useless a shoeless horse must be in these ranges, I determined to return back without delay. Before travelling in this country, not only should the horses be well shod, but each rider should be supplied with a few spare shoes and

plenty of nails. The shoes themselves are seldom lost. We arrived at the depôt-camp by sundown, when I gave the order for commencing our homeward march the next morning. Mr. McRae returned from a pedestrian trip shortly after my arrival. He had been with Graham up the western branch of the river, and after getting over some rough-and-tumble country, which however could be traversed by horses, they gained the summit of some table-land, which was, for this place, fair travelling, and extended in the direction we intended to have gone. He considered the opening at the spot where he turned back, about 4 miles from camp, of a promising nature. During our trip to-day there was less grass than usual, spinifex being the rule.

*April 25th.*—Returned on our tracks. Tried occasionally to get a better crossing-place over the McRae, but were not successful. These crossings caused some little excitement, and the leading horsemen generally waited on the opposite side to see the whole party safely over. The scene thus viewed was not devoid of interest. Masses of rocky hill, rising perpendicularly several hundred feet above the water's edge, with just sufficient ledge at the base to permit the party in single file to travel along; the river tumbling over immense stones at the ford; the hills, with their accommodating ledge, on the other side. We (Mr. McRae and myself) just got across the third ford, and going a little down the right bank of the river, turn, and after a few minutes' halt, push through a thicket, which, although we have broken through it three times before, seems as impervious as ever. It is formed of stiff thorny trees, or rather shrubs, which spring up from among the stones; no vestige of earth to be seen. They are sufficiently high to meet overhead. What with guiding the horses over the stones, and defending head, body, and limbs from the thickets, all are well employed. But this is not all. Showers of green ants descend upon our heads and shoulders, and it must have been amusing to a looker-on to see persons at the same time hastily engaged protecting themselves from ants, thickets, and the rocks at their feet. Happily the thicket is a small one, and we emerge hot enough, but with leisure, to destroy the insects which have been persecuting us. The green-ant is about half an inch long, of a light arsenic green, and dwells amidst the foliage of trees. Their bite is very sharp, but beyond the pain at the time, no great inconvenience is suffered. A small black ant, with a red head, is a more troublesome insect. For some time after being bitten there is much pain, and the part swells. Their bite, in its effect, is similar to that of the serjeant-ant. Luckily they are not so plentiful as the green ant, nor do they reside in trees, otherwise passing among their habitations would be a task unpleasant, to say the least. We halted early at the camping-place of Monday week, and where

Mr. McRae had marked the white-gum-trees. Here we remained for the rest of the day. Two miles south of our present halting-place we came down a very steep hill, to avoid that which we had hitherto ascended and descended, and which I described in a former part of my Journal. We did not gain by the change; it was quite as steep as the hill we avoided, but somewhat shorter. Discovered among the rocks of our camping-place a creeping plant, with leaves and tendrils like those of the cucumber, only much smaller. The fruit was the size of a small cherry, quite round, of a bright scarlet colour. The taste is like that of the cucumber. This is the most uninteresting, as regards situation and aspect, of our halting-camps among the ranges, and yet there is a greater variety of trees and vegetable productions than in any other. Each time that we have visited it I have found something new. I collect, as well as I can, specimens of fruits and seeds, but from not having proper receptacles, many of them get mixed, crushed, and broken. I also collect ripe seeds of every plant near our camps, although I do not know the nature or the character of the blossoms—many of them are creepers. This has been an extremely hot day. Mr. McRae told me that he had seen, though not in this part of the North district, a guana having a hood, which, when the creature is in repose, lies flat on its shoulders and back, but, when it moves, is spread open, and when it jumps from tree to tree, appears to act like a wing. It is of moderate size—the guana, not the hood. Since my return my son informs me that he has seen one of these animals. We saw very few guanas during our journey, and I have not met with a snake in all my rambles on foot and on horseback; but two have been seen by our party during this journey—a small and a large one—and three were killed at the Government Camp in our absence—one of them upwards of 10 feet long. They cannot be considered plentiful in this part of Australia. We have seen numbers of butterflies of endless variety and hue. An entomologist might spend some months very pleasantly and profitably here. In fact there is a new field opened for students of Natural History in every branch.

*April 26th.*—Did not start until half-past 7. Arrived at depôt No. 1 at 10 minutes past 10, and crossed the rapids at the Glenelg at 10 minutes to 11. Here we halted. Mr. Cowle states our latitude to be  $15^{\circ} 44' 28''$ . He is convinced that these are not the rapids of Grey, which are 2 miles further up the river. I did intend strolling off to visit the lower rapids, but some of the horses had swollen backs, and I thought it advisable to defer this visit to a future time, and bring the animals home before they got worse. By shifting saddles, padding, &c., we have hitherto managed to save the horses, who have only suffered in the feet

and legs. In condition they are not worse—some of them I think are better—than when they left Camden Harbour. Noticed a herb with a grass-like stem, with seeds like those of wheat, but reversed, lying upon the stem like the barbs of a spear. We started at a quarter to 3, and after crossing the divided stream of the Glenelg—we had been encamped on the island between the two streams—struck a direct course, instead of following back our tracks by the bank of the Glenelg. The numerous streams which impeded our progress before therefore passed to the eastward or higher up, and this, together with the drying up of the water, enabled us to push along with greater ease and rapidity. We passed over lightly-timbered and well-grassed country, tolerably level, with clayey, sandy, and gravelly soil, sometimes one and sometimes the others, but the same description of herbage and timber on each. In crossing the stream upon which we camped on the 16th instant,—and which we called Mosquito Creek—but higher up, my horse got jammed between the banks, and we had some difficulty in extricating him, the bottom being soft, the banks steep, and the stream-bed narrow. Shortly after leaving this place, we came upon our outward track, which was very plain, and which we followed. Most of the streams which had contained water when we passed a fortnight since were now dry, and we had to push on until dusk, when we were fortunate enough to arrive at the creek known to us as Frying-pan Creek. There was plenty of water here. We camped on the south bank, and soon found we were in a mosquito neighbourhood. There was plenty of grass, but the ground was so stony, that it was a difficult matter to pick out sleeping ground. However it was not of much consequence, as the mosquitoes would not let us rest. Mount Lyell bears north-west, about half a mile distant. This two-peaked hill is connected at the bottom by rising ground. There is no apparent difference in the height of the two peaks, looking from our camp at daylight. Both peaks were composed of bare red rock—either basalt or trap. After leaving the Glenelg, and not far from its banks, the ground was covered with lake-coloured everlastings; further south the everlastings are dark crimson, and near Camden Harbour pink and white.

*April 27th.*—We were all up before daylight, but the horses had rambled further than usual, and we could not start until half-past 8. We crossed the Gairdner at 5 minutes past 2, higher up than on our outward trip, at a gravelly ford. The stream-beds which we crossed generally contained water, but not so much as when we passed before; the water was now for the most part in pools. Camped on the Gairdner. Particularly noticed Mount Lyell in passing. There are neither trees nor herbage on either peak, and very little of either on any part of the hill. At its



base there is the usual supply of grass and scattered timber. On a hill to the north of Mount Lyell we collected some very large pods of a triangular shape, from a creeper with a thin stalk. The pods were disproportioned to the size of the stalk, nearly as much so as a melon is to a melon-vine. They were not quite ripe, but ripened by keeping, and, bursting open, exhibited a large quantity of a cotton-like substance, with which the seeds were enveloped. Encamped at the Gairdner, under the so-called mulberry-tree, the large dark leaves of which shaded us from the sun. Some of the ripe fruit dropped, but they were full of maggots. Left the Gairdner at 20 minutes past 3, and at 5 o'clock halted for the night on a creek running south, near the largest currant-tree I have seen. It was loaded with fruit, which we obtained by cutting down large boughs. We have not seen much game since leaving the Glenelg. Yesterday we came across two emus, and to-day saw one kangaroo, and birds called native companions—a species of heron apparently. They were large birds, and I took them at first for turkeys. The creek was very bare of water, which seemed to be drying up fast. The mosquitoes were very troublesome, as they have been at every place north of the Glenelg and at our first dépôt south of that river. Some of the people declared they were three inches long, but this is not the case. The largest may be half an inch long. There is no doubt but that they are great pests, and I do not envy the first settlers of this portion of Western Australia.

*April 28th.*—We proceeded homewards by 10 o'clock, and were again among those from whom we parted a short time ago, and who came around to know all about the new country we had seen.

If the result of our journey is not what we hoped, it is not altogether unsatisfactory. Our knowledge of this portion of the country has been enlarged, and we have no longer to rely upon the statements, or to be guided by the opinions, of others. Our expedition has proved to my satisfaction that the country over which we travelled, south of the Glenelg, was similar in every respect to that travelled over by Grey some 15 miles to the eastward, and the probability is that the intervening country is of a like nature. Whether it is as rugged and unpromising to the westward I hope to discover by sending an expedition in that direction. At the spot where we turned back, which was a few miles south of Grey's, and some 10 or 12 miles north of Lushington's farthest, the prospect of advancing in our course, on horse-back, was very poor. There was an opening to the westward which might possibly lead to an outlet from the ranges in a southerly direction. This will have to be tried. Should the attempt

fail, then horses must be taken as far as practicable, and from this point parties on foot must explore the ranges.

Should level and fertile country be discovered south of the ranges, then the hills over which we travelled will not be valueless. Not only do they admit of stock being driven over, supplying abundance of feed and water, but the elevation of the land will render it well adapted for runs upon which to depasture, at certain seasons, a portion of the stock which at other times feed on the plains. The land does not of course yield so much grass, even in the most fertile spots, as in the plains, much of the country from its nature being unproductive; yet a limited number of stock may be kept in good health and condition in the ranges, which, I am convinced, will become valuable when the low country on either side is occupied.

I do not consider, nor do those whom I have consulted consider, that sheep ought to be imported *at present*. Setting aside all question of climate, the feed in its present state is not adapted for sheep, but for large stock only. To bring sheep into this district would, to say the least, be attended with much risk. Those that have already been introduced have not done so well as to encourage the importation of others. I am aware of the force of the arguments employed to show that the fate of the sheep landed at Camden Harbour ought not to influence speculators. It is said that they were too young to withstand the effects of a sea-voyage and a tropical climate, that they were not properly tended, that they arrived at an exceptional season, that they were depastured in the neighbourhood of the sea-coast, and so on. I allow all this, but, at the same time, I do not see any reason for not discouraging the importation of sheep *for the present*. Whether they will ultimately succeed, when the feed is cropped down by larger stock, I cannot tell—time will show.

For horses, it is the opinion of every one that I have spoken to on the subject, the country is admirably adapted. The feed is well fitted for horses, who improve in condition, and they may be reared in large numbers for markets close at hand.

Whether the feed and climate is adapted for cattle we have had no opportunity of judging from personal observation, as none have been imported, but those who have been accustomed to this description of stock speak highly of the capabilities of the country for such purpose. One fact appears tolerably clear—that there is no poisonous plant calculated to affect ruminating animals—or in fact others, horses doing well—for none of the sheep have died from the effects of poison. It was supposed, shortly after we landed, that some of the Government sheep had died from the effects of poison. I did not credit it at the time, and I am now convinced that no vegetable poison exists. I speak of course only of the

country near the sea-coasts, where the sheep have been depastured, but I may add that I have seen nothing in my travels at all resembling the poison plant of South-Western Australia. What will be the value of horned stock reared here will depend upon the progress of settlement. Without a dense population, it appears to me that their value must be estimated by that of the tallow, hides, and horns they yield, less the cost of production.

I do not say much respecting the agricultural capabilities of the country over which we passed, because our course would necessarily lead us from the low country. I must confess, however, that the alluvial land on the banks of rivers and streams was of less extent than I anticipated. Of its richness there can be no doubt. But were the quantity ever so great, it would not promote settlement. In this climate no white man could till the ground, nor would any white man be able long to endure the attacks of the insect enemies. In most parts of Australia these nuisances disappear, or at all events become less, as settlement extends, but here the nature of the crop on low alluvial river-side lands would encourage, and not disperse, the mosquitoes.

If coolie labour is to be employed it will be when pastoral occupations gradually lead to others, and when wealthy speculators grow articles of commercial value. Rice, cotton, sugar, indigo, tea, coffee, &c., will not be cultivated by the class of men who usually emigrate to new countries and form the bulk of the population. Except in the event of some extraordinary or exceptional inducement for immigration, such as gold in large quantities, or other metals which may be easily worked and transported to the port of shipment, I do not conceive that the country I have seen will be the home of a large European population. It is essentially a pastoral country, and will be permanently settled only by the extension of pastoral occupation from the southward. It is my conviction of this fact and my knowledge that establishments have already been formed along the north-west coast, that make me so anxious to penetrate the southern barrier which separates this portion of Australia from the more level country to the southward. We are now but a comparatively short distance from Roebuck Bay. When once a pass is found—it is not more than two weeks' journey from our furthest depôt, and an opening once made, extension of pastoral occupation is but a question of time.

Of the natural resources of the country over which we passed, I am not qualified to give a scientific opinion. There are many vegetable productions, which may become, which perhaps are, valuable in connection with arts and manufactures, medicine, &c., but I cannot state the fact with certainty. Of the trees, I may safely say that for building, for furniture, or even for fencing, but very few are available, and those in situations which would require

their being consumed on the spot. Some of the timber might be valuable for turnery and small ornamental work, for it is very hard and close-grained, but for all domestic and field purposes wood will have to be imported, especially for the coast settlements—if any.

On the sandstone ranges there are no indications of mineral deposits, but at the base of the hills and in the lower valleys, among the basalt and trap, there are evident signs of much metallic accumulation. Our time did not permit us to make a close examination; nor do I think the knowledge possessed by any of our party was sufficient to render the time profitably employed which was devoted to mineral researches. I have mentioned one spot as offering a prospect of gold-discovery, and also alluded to the specimen of copper-ore brought from the Glenelg. I may likewise state that there was an abundance of iron ores, some of them very pretty specimens, but otherwise of no value in a new country.

The health of every member of the party, excepting Mr. Cowle, who had an attack of incipient fever for two or three days, was excellent. Not only did cuts and sores, brought with us from Camden Harbour, rapidly heal, but any damage received en route from stone or wood, also healed in the course of a few days. Men and horses both looked as well on their return as when they started. Even the horses' legs looked healthy, considering the battering they had received. With fine weather, good water, the absence of all privation, or even annoyance, except the mosquitoes, a short trip, and good health, it is no wonder that we were all pleased with our journey. For my part I have seldom passed a more enjoyable time than that which I spent during our wanderings among the sandstones.

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XVI.—*Marine Survey of the Northern Territory of South Australia.* By Mr. F. HOWARD, Master R.N., to the Governor of South Australia.

(Communicated by F. S. DUTTON, Esq., F.R.G.S.)

ON the 13th of May, having embarked the Government Resident in the surveying schooner *Beatrice*, we proceeded to ascend the Adelaide River, it being the intention of Colonel Finnis to explore the upper part. We arrived at an anchorage about 6 sea miles above the farthest point reached by the *Beatrice* last year on the 17th.

The same evening we were visited by a party of natives, who came again the next morning; but on this occasion they were not

allowed on board. I did not encourage their visits, as the river here is very narrow, and the vessel was moored with warps to the shore on both sides, and we had already seen something of their pilfering habits. They belonged to the same tribe we had met before, and with whom the affray at the first camp had occurred. These natives having been sent away, we saw no more of them during this trip.

On the 19th, both boats left to explore the upper part of the river, the Government Resident going in Mr. Guy's boat. After proceeding about 15 sea miles above our anchorage, we camped for the night. As I had to return to the vessel on the following morning, I pulled up a mile or two farther, the river keeping a depth of 12 feet, but getting very narrow—not over 20 yards, and being almost blocked up with snags.

We obtained a good latitude position at our camping-place, there being three observers, and on the following morning I returned to the vessel. Mr. Guy and the Government Resident proceeded towards the head of the river, but were only able to get about 3 sea miles above our camp in their boat, to a place a little way beyond where the river forked. They then followed its winding course on foot 2 miles further south to lat.  $12^{\circ} 56' 15''$  s. At this spot the river had dwindled to a running brook 4 or 5 yards wide, with deep pools here and there. The country round was a level open grassy forest of gum, scrub, and paperbark-trees, the banks of the stream being lined with tall bamboos. The river would be navigable for a vessel drawing 10 feet, and about 100 feet long, about 3 sea miles above our May anchorage, when she would be stopped by the first bar of rocks, which are nearly dry at low water. Beyond this the white-stemmed paperbark-trees make their appearance, and get more numerous as the river is ascended, until in the long s.e. reaches, near the upper end, they are the prevailing feature of the banks, and make the river very snaggy. In May the water was slightly muddy at the ship and very good, but a few miles higher it was quite clear. In ascending the river, and rounding the different reaches, the appearance of high woody land at the end of nearly every reach was a great contrast to the dead flat of the lower part of the river.

On the 24th of May I visited a part of the Daly Range, about a mile north of Fred's Pass. The view of the country from it was splendid, the grass in the plains being yet quite green, and even where lately burnt off springing up again. The hill we were on had been burnt only a day or two previously, so that it had a most barren appearance, being composed entirely of masses of white flinty sandstone, which appeared harder than granite. All the hills on this range seemed rocky or stony. The summit was thickly clothed with stunted timber of various kinds and variety

of foliage; on looking to the south-westward, over the range, we saw that the country continued hilly and thickly wooded as far as the eye could see. To the eastward stretched an immense plain dotted over with lines and groves of trees marking the course of some creek or the river itself—no part of the water of which could be seen.

On the 25th of May, a small party of natives—one man and four boys—came down on the east bank of the river. They belonged to a tribe we had not seen before. The man, after some time, ventured on board, crawling along one of the stern warps, and Mr. Guy succeeded in getting a photograph of him. This party seemed to understand bartering better than those farther north.

We weighed the same afternoon, and arrived off Escape Cliff on the 28th of May. The same morning (28th), we had an interview with a large body of natives, who mounted in the tall mangroves to view the schooner as she lay at anchor waiting for the ebb stream to take her out of the river. Two only swam off to the vessel, and were afterwards landed in the boat; they had been on board before, last year.

The Government Resident not being ready to proceed to the Victoria and coast south-west of Adam Bay for a month, I thought this a good opportunity to visit the Gulf of Carpentaria, to carry out orders, and accordingly sailed on the 5th of June.

The wind being strong from the eastward and south-eastward, we had to work to windward along the whole of the north coast of Arnheim's Land, and down the Gulf of Carpentaria to Limmen's Bight—this made it a long voyage. I had expected to make the passage in ten days, but such was the strength and steadiness of the wind and current against us, that we did not arrive off Beatrice Inlet, in the Limmen Bight, until the 20th of June.

We sighted Port Essington and ran along the coast, getting a view of Port Bremer and Raffles Bay. Port Essington appeared a dangerous place to approach, Vashon Head and Port Smith being so much alike; and on our return passage, we nearly ran on shore attempting to run in after dark, having, as we thought, made out the entrance plainly at sunset. The land eastward of Port Essington gradually rises, and seems to improve about Raffles Bay.

The wind being very strong from E.S.E., we tried to make a short cut by going through Bowen Straits and crossing Mount Morris Bay, but after working through all day, we found the south end entirely blocked up with shoals, and had to anchor off Croker Island for the night. We had a good view of the west side of Croker Island, which appeared to be rather stony and mostly covered with scrub; towards its south end it appeared to

be much higher than the mainland. The Raffles Bay side of Bowen Straits was densely wooded, without a clear spot, with good-sized trees, mostly paperbark and white-gum. We had a visit from three natives who came off from Croker Island in a small sampan, a boat of Malay build. We hove to for them, as it was blowing strong. On coming alongside, one of them held up a fine large fish, saying "Commander" plainly enough, and on my making my appearance he presented it at once. This is the first and only case I have ever seen of a North Australian native making a present. These people had iron spear-headed fishing-spears in their boat, ate biscuit and drank coffee eagerly, and appreciated tobacco and cigars. I did not hear them make use of any English words, except in repeating them after our men; but they kept crying out several Malay expressions, apparently without knowing their meaning. They remained on board nearly thirty minutes, when we had to send them away and pursue our voyage.

After leaving Croker Island we had very strong south-east winds for four or five days, and on the morning of the 12th of June remained hove-to under our close-reefed mainsail for six hours. The wind was steady from south-east and generally blew a fresh gale from midnight to noon, when it usually moderated.

Having to keep outside New Year Island and the adjacent shoals, we saw nothing of the coast till the afternoon of the 12th, when we ran into Junction Bay, and came to at 8 P.M. We found this a more considerable opening than the chart had led us to expect. The coast was very like the coast of Adam Bay, densely wooded, and with occasional low red cliffs. Towards the head of the bay, which we could only see indistinctly, the coast seemed fringed with mangroves. The flood-stream set to the south-westward from our anchorage (in 11 feet at low water, and about 1 mile off shore) towards a large creek or river falling into the south side of the bay. We weighed soon after daylight on the 13th, and kept as close along shore as the south-east wind would allow, passing about 10 miles north of the Liverpool River. This part of the country appeared to be thickly wooded, and rising toward the west bank of the Liverpool. From the number of fires along the coast and inland, I should judge this part of the coast to be thickly inhabited. At noon of the 14th of June we sighted Point Dale, and soon afterwards the Wessel Islands. Working through Bowen Straits, and past the English Company's Islands, occupied us till the 16th. These islands, and so much of the mainland as we could see, appeared rather barren, being covered with small scrub. Yet, by the fires we saw on shore, both the above-mentioned groups must be inhabited. Although it was the middle of June, the climate here was quite humid, and

several showers of rain fell each day—the sky being generally overcast and cloudy.

The wind still kept against us, so that we did not anchor in Limmen Bight till the afternoon of the 20th of June, when we came to in  $2\frac{1}{2}$  fathoms, about 2 miles north of a small island lying 3 or 4 miles off shore.

After obtaining observations next day, I started with Mr. Guy to explore the various openings in sight along the low mangrove-shore, commencing with the most southern, as being nearest to some isolated white rocky hills. This creek (No. 1) was a mere drain, with mangrove-banks and numerous small branches. We pulled the boat up until she jammed against the banks each side. The bottom of the creek was sand and mud. Leaving the boat, we stepped out into a bare sand-flat, extending to the foot of the northern isolated rocky lump which we had called Mount Young. One creek and all its branches expended itself at high-water spring-tides in flooding the plain across which we walked to Mount Young.

From the summit of Mount Young we had a good view of the surrounding country. To the southward and south-west appeared similar bare rocky hills, shining white in the sun, the more distant forming a range, thinly wooded. Between this range and the sea was a thick scrub. Turning to the northward, the country seemed completely cut up by large creeks running in all directions, one of which could be traced inland to the horizon, and which I at once concluded to be the Limmen Bight River.

The coast to the northward seemed thickly covered with low mangroves for some distance inland, through which ran many small creeks; inside appeared bare sand-flats, extending to the north-west as far as we could see, with narrow slips of grassy land here and there. The whole country in this direction seemed a dead flat, subject to occasional inundations. Our view over the plains was somewhat obscured by thick clouds of sand, driven along by the fierce south-east wind, now blowing almost a gale; so, finding we could do no more with the theodolite, which required to be held in its place by the legs, and came to grief after all, breaking a level, we descended as fast as the rocks would allow us. The natives were firing the country close to the foot of the hill on the land side, but did not trouble us.

Mount Young and the other hills we afterwards visited are all composed entirely of the same kind of quartzose sandstone as the Daly Range on the Adelaide River; and some of the large blocks were so hard as to beat in the back of my tomahawk without my being able to make the least impression. In crossing the flats we noticed numerous tracks of natives, dogs, and emus.

Getting out of No. 1 Creek as quickly as possible, for the sand-



flies were very thick, we sailed round to No. 2 opening, a fine broad creek, nearly half a mile across, and from 2 to 5 fathoms deep, and after ascending it for 8 miles, came to for the night at a place where it seemed to be joined by No. 3 Creek, with an increase of width. The bottom of No. 2 was either mud or brown sand, and the only rocks seen were on some small, stony ridges, from 20 to 40 feet high, and consisted of coarse reddish and white sandstone. These slight elevations were usually covered with gum-scrub, whilst the surrounding country was either bare flooded plains, or grassy, with stunted trees and mangroves, the soil everywhere light and sandy. This description applies not only to the soil round No. 2 Creek, but to all the other land we visited in the night.

Passing over No. 3 for the present, I shifted the vessel several miles to the north-west on the 24th, and left for No. 4 Creek, getting to the head of its main branch the same night. It ended in a sand-plain at the foot of one of the stony ridges. We went up as far as the boat would go, and came back 3 or 4 miles, where we camped for the night. The bottom of this creek was generally sand; at the upper part the sand was being blown into the creek off a bare dry plain in considerable quantities.

After descending No. 4 Creek I ran along the coast to the north-westward as close as the sand-flat bounding the shore would allow, passing by a low mangrove-covered beach, with several small high-water creeks up which no boat could have gone, and on rounding a point came on No. 5 Creek, which seemed promising, inasmuch as it seemed to me parallel to the coast. I could not enter, however, as it was entirely barred across, being just now low water. So we ran on past a flat, grassy country and sandy beach until we came to Spillen's Creek, which, being practicable, we ran, and made our arrangements for passing the night. Next morning, after the observations requisite for the survey had been taken, we started up Spillen's Creek, which appeared to have an unusual number of branches, the main creek soon became a mere muddy drain, dry at low water, and with iron-stone pebbles mixed with its bottom of mud. The land round where there was an opening in the mangroves was low and sandy, and in places well grassed.

After leaving Spillen's Creek we ran along the coast to the north-west without seeing any opening we could take. Past a mangrove-point with a sandspit in its north-west side inside, which appeared to be a creek, but at this time we could not get near it, the mouth being blocked up by breakers, extending nearly half a mile off shore. The wind was strong from east, so we stood along the coast towards some sand-hills, the first we had seen on this coast. Having effected a landing under the highest

(about 50 feet). I got a good view of the surrounding country from its summit. The view to the south-east was intercepted a mile's distance by tall mangroves, but inland for miles, and round to a W.N.W. bearing, appeared the bare flats I have before mentioned, some dry and with dense clouds of driving sand rushing over them, others partially flooded. There was a small tea-tree scrub in shore of the sand-hills with a salt-swamp between, and, from the presence of a few mimosa-bushes at the foot of the hills, I expect fresh water could be easily obtained here.

The only break to the dead level of the country in sight was a small range some 20 miles distant, in a S.S.W. direction, which I at once called Solitary Range. The coast looked so unpromising that I determined to proceed no further, if I found the latitude to be north of the fifteenth parallel. So the wind having fallen, we found our way into Sandhill Creek, where we passed the night. The mean of my star latitudes on the sandspit coming as near as possible  $15^{\circ}$  S., and having had the coast for 3 miles north-west of it under my eye, I determined to return to the ship, having had enough for the present of mud and sand-flies. Sandhill Creek proved to run in a regular labyrinth of small mud-drains and mangrove-swamps, dry at low water; and we had some difficulty in getting out of it.

On our getting well out from the land, I observed the schooner under weigh, running towards us. Mr. Guy having run down, thinking we might have some difficulty in getting so far to windward. We hoisted the boat up, and worked up under the lee of Maria Island, where we came to in smooth water. The motion at our former anchorages had been violent, particularly during the ebb tide.

The 28th, 29th, and 30th of June, were spent in surveying Maria Island, wooding, &c. The island may be described as of good elevation, with a very stony soil, and covered with brushwood. Its rocks were coarse sandstone. In most of the flats fresh water had lain not long before; and I have no doubt a strict search would have enabled us to find some at present on the surface. In one place we found an old canoe, and late tracks of eight natives, but saw none.

We left Maria Island on the 1st of July; and on the 3rd, Mr. Guy explored No. 5 Creek, finding it very like all the others, with a muddy and sandy bottom, in some places mixed with iron-stone pebbles. Little now remained to be done, viz., to explore No. 3 Creek, and some of the branches of No. 2, which appeared to run towards the hills. Mr. Guy performed the former service, whilst I proceeded up Oyster Creek, which, after running to the southward 4 miles, and sending off numerous small branches, became a drain about 6 feet wide between mangrove-banks. As

it was high water we managed to force the boat up to nearly the end of its course as a running stream. The country here was a decided improvement on any we had yet seen, though the soil was still very light and sandy, the grass looks very fine, and numerous large paperbark-trees were scattered about, up one of which I got; and, seeing a dry sandy continuation of the creek, followed it up with a man as fast as I could. This dry bed had only small salt-water holes here and there. It ran over a sandy and rocky bed. I knocked up some of the rock, and found it of the same kind as that which forms Mount Young and the other hills. Here and there we came on holes filled with crystalized salt—showing that this part had not been flooded for some time. Most of the sandstone in the bed of the creek was impregnated with iron. We saw numerous native-tracks crossing the bed of the creek. After getting to within half a mile of a stony hill of the same character as Mount Young, we retraced our steps as fast as we could, fearing the falling tide would leave our boat in the present undesirable position for the night. On our way back I picked up a small water-worn quartz pebble, broken into four pieces. This was the only piece of quartz I saw on the mainland, although I observed some among the rocks on Beatrice Islet. We had some difficulty in getting our boat down the creek, the tide having fallen a foot, and managed to stave her, but not badly; the bottom of this creek had in places ironstone and other pebbles mixed with the sand and mud.

We camped for the night at the entrance of Cockatoo Creek, which we ascended next morning; it soon became very narrow and winding, but a rising tide enabled us to pole the boat to within a few hundred yards of its end, which we found in a sand-flat not far from the foot of Mount Young. After again visiting Mounts Young and Hummock, I returned to the boat and got on board the schooner the same evening.

Mr. Guy did not get back till the evening of the 6th, having ascertained the connexion of Nos. 2, 3, and 4 creeks, and that No. 3 was the main outlet of the Limmen Bight River, which he followed up in the boat for 16 miles, where it was still nearly three-quarters of a mile wide. The various creeks he had explored generally ended in sand-flats, and near the end of one he came on a fresh-water hole; the bottoms of these creeks were sand or mud.

Only one native had been seen, though I am sure we were generally watched, and at Spillen's Creek the natives had fires not half a mile from us. On every occasion of going on shore we kept a good look-out for any traces of white men, but saw nothing which could lead us to suppose that either the islands or mainland had been visited.

We had now been absent from Escape Cliffs for more than a month, and as Mr. Guy and myself were satisfied with our exploration so far, and that we could gain no more information without bringing more experience to bear than we felt could be expected, we determined to get back to Adam Bay as fast as we could. Had there been time we should have liked to have examined the coast up to the Roper, and tried to find a navigable entrance to that river. During our stay in the Gulf of Carpentaria the weather was cool and bracing, and everybody on board enjoyed excellent health.

We reached Adam Bay on the 16th of July. On our return, the *Beatrice* was at once employed to take a survey party of over twenty men, their tents, stores, and two months' provisions, up the Adelaide, at the request of the Government Resident. This occupied us till the 28th of July. We landed the party higher up the river than we had before taken the *Beatrice*—the object being to get a good landing-place and camping-place close by. The river-banks here were rather steep and about 10 feet above high-water mark; we were about  $1\frac{1}{2}$  mile below the limit of navigation for a vessel of our draught of water; the river was about 40 yards across. We filled up 8 tons of water abreast the camp—baling it up from alongside. It was very muddy for a day or two, but then became remarkably clear; we have been using it ever since, and it has always been quite clear and sweet.

From the 28th of July to the 5th of August we were employed busily wooding, painting, repairing sails, and refitting generally, which was much needed. During this period the natives murdered Alaric Ward, the shepherd, in the middle of the day, and within sight and hearing of the camp. The natives had commenced their depredations two months previously, and had been getting gradually bolder—their last exploit being the thorough sacking of a tent at the Narrows Camp whilst its occupants were in another tent at breakfast.

The murder of Ward caused great consternation at the camp, and delayed our sailing for the Victoria some days. We employed the interval in surveying and sounding out the south channel through Clarence Straits, which we found to be good, though narrow, with deep water.

We left for the south-west coast, with the Government Resident on board, on the 12th of August, the *Julia* being in company. We passed by Port Paterson (having before visited it, being within reach of Escape Cliff at any time by boat), and commenced our exploration in the bay north of Point Blaze. The morning of the 14th opening in a thick fog, the Government Resident left in the *Julia* to explore the coast close in; and in the afternoon we followed round the bay in the *Beatrice*, the coast proving very

low, and fronted with mangroves, and the land inside apparently swampy for 5 or 6 miles inland.

Blaze Point was a low wooded point, with extensive rocky ledges extending more than a mile of shore. As the wind fell light towards sunset, and we began to feel the ebb-stream setting strong to the northward, we came to off Blaze Point. Weighed at daylight, and commenced working down the coast outside the Peron Islands. We only saw the mainland here from a distance; it was very thickly wooded, and gradually rising towards Channel Point, where it attained a height of about 80 feet a short distance inland.

The Peron Islands are sandy, with grassy sandhills along the west coast, and a grassy peak at the north end of the northern island nearly 100 feet high. These islands have extensive reefs and sandbanks off their west sides, running out to a distance of two or three miles, outside which the soundings are very uneven, and bottom rocky.

About sunset we brought up in Anson Bay in  $3\frac{1}{2}$  fathoms, about 3 miles north-west of Cliff Head, and found the flood-stream setting E.S.E., and ebb W.N.W., during the night, about one knot per hour. At daylight next morning we observed a large opening in the low land at the east corner of the bay. Weighed, and stood towards it, as it had the appearance of a large river; but, soon getting into 10 feet water had to bear up, and then steered for Channel Point, which we approached to within 3 miles, when the water shoaling to 2 fathoms, we again retraced our track, hauling to the wind and working along shore to the southward, and always getting into shoal water some distance off the east side of the bay, till, at 10 A.M., we came to in 11 feet (low water), Cliff Head bearing S.E. by S. about  $2\frac{1}{2}$  miles. The Government Resident then left in the *Julia* to explore the river, which we decided to call "The Daly," should it prove of any size. The ebb-tide meeting the *Julia* in the entrance, they were only able to get up about 4 miles during the afternoon—the tide being very strong, although this was the period of neaps. The river at the *Julia's* farthest was about 500 yards broad, with 4 fathoms water at half ebb, and mangrove-banks and in all respects looking very like the lower reaches of the Adelaide. A long, narrow mangrove-island divided the entrance, the east channel part, which was the deepest. Numerous drift bamboos were lodged among the mangroves, proving the river to come from a long distance inland, and to be a fresh watercourse.

The shore or coast, between Channel Point and the mouth of the Daly River, consisted of a dense forest of mangroves, very high, with small creek-openings here and there. From appearances, I should think that a ship-channel will be discovered, from

the mouth of the Daly running close in to the eastern shore of Anson Bay, and out to the northward of Channel Point, between Peron Islands and the main; although the *Beatrice*, being on the west side of the shoals, could not get into it.

Cliff Head is a line of red cliffs, very like Escape Cliff, running along shore in about a s.s.w. and n.n.e. direction for more than a mile, and projecting very little, if at all; it is about 50 feet high, and the land behind rises to a height of about 120 feet, and then falls gradually; it is thickly wooded. Between Cliff Head and the Daly River the land is low, with a sandy beach. A sand-flat, dry at low water, extended off shore about half a mile, along this part of the coast. Southward of Cliff Head the land became low and apparently swampy, with mangroves inland behind the beach.

At daylight, on the 17th of August, we weighed and ran to the southward and south-westward for 9 miles, about 2 miles off shore, in 3 and 4 fathoms; the coast being very low and thickly wooded, with several high-water creek-openings. We then came to another red cliff-point, more deserving the name of head than the last, but not so high, with a curious flat-topped rock, about half a mile off shore, outside which we passed at a quarter of a mile distance, in 3 fathoms water. We then continued our course round Anson Bay, about  $1\frac{1}{2}$  mile off shore, in  $2\frac{1}{2}$  and 3 fathoms. The land was very low and thickly wooded. From the number of fires hereabout, I should think this part of the country must be thickly inhabited.

Anson Bay has been described as a fine harbour for shipping, and free from shoals, and we found the water quite smooth and holding-ground good, in this season and during the south-east monsoon; but from the appearance of the beach, I should think the westerly monsoon sent a heavy sea into the bay—a vessel might even then get temporary shelter by anchoring in the west corner, under Cape Ford. The east side of the bay appeared very shoal, and I expect, from December to March, there is a heavy break the whole distance from South Peron Island to Cliff Head.

Cape Ford we found to be a long low slim point, instead of the round flat point it appears on the chart; a ridge of high land runs south from it, along the coast to the southward. For the first 5 or 6 miles south-west of Cape Ford the coast has a most barren look, consisting of high, bare sandhills. Clump Point was low and sandy—a mere long sand-pit, with a few low mangroves at its extremity, and a large clump of the same a little distance back; a dangerous covered reef extended some distance south-west of the point.

Between this point and Cape Dombey, the coast was thickly wooded; for a few miles south of Clump Point fringed with low

white sandhills, and then with occasional long lines of low reddish cliffs, under which ran a continuous sandy beach. At the north point of a shallow bay, about 12 miles south of Clump Point, the bottom was rocky and soundings uneven, and a rock or ledge breaking was observed about  $1\frac{1}{2}$  mile off shore. We anchored about 8 P.M., a few miles north-west of Cape Dombey, and about half a mile outside a rocky ledge, marked "breaking" on the chart, but at present standing about 5 feet above water, and 200 or 300 yards in diameter. We next morning proceeded to examine a bay between Cape Dombey and Port Keats, in which appeared a large opening on the chart; we found it, however, entirely closed up by a low mangrove-flat, the only opening being a very small stream running into the sea at the east end of a long white cliff, and which had a sand-bar right across it. As we stood along the south shore of the bay, we observed the land become lower and looking swampy as we approached Tree Point, Port Keats, off the mouth of which inlet we anchored for the night.

Next morning, at low water, we saw we were anchored close to some very ugly-looking rocks, which, together with those off Tree Point and Cape Hay, would be very dangerous for large vessels entering. During the afternoon we ran into Port Keats with the sea-breeze, and anchored 5 or 6 miles inside Tree Point. The shores of Port Keats looked exceedingly low and swampy, the only high land visible being Mount Goodwin to the southward; the navigable part of the port is narrow, extensive shoals running off on each side; there is a sandy point and low cliff just inside the west entrance point, but all the rest of the shore is mangrove. The Government Resident proceeded to the head of the port in the *Julia*, and found one or two landing-places; the land, however, was very barren and stony.

We sailed from Port Keats on the morning of the 20th of August, and after rounding the extensive shoals off Cape Hay, steered for Point Pearce, north-west of which we anchored at 8 P.M. The coast between the above points appears nearly straight, with sandhills and cliffs in several places. At our anchorage, north-west of Point Pearce, in 17 fathoms, the ebb-and-flow stream ran north and south more than 3 knots per hour.

At 1 P.M. on the 21st we weighed with the first of the flood, and a light north-west breeze, and steered for the Victoria River. We tried to pass over Mermaid Spit, but the strength of the tide prevented us. At dusk we came to in 8 fathoms, having regulated our course by sextant angles of the distant hills to the eastward, and at low water next morning finding we had made a very lucky hit, being right in mid-channel between the sand-heads. Point Pearce had been out of sight for three hours, and I am afraid the weather is but seldom clear enough to allow of its being

seen from the sand-heads, and used as a leading mark. The dry sands had somewhat shifted and altered their shape since surveyed in 1840. At our anchorage the tidal streams set N.W. by W. and S.E. by E., about 4 knots per hour, and rather too much across the channel to be pleasant. At 1 P.M. on the 23rd we weighed with the first of the flood, and a very light wind from north-east, which gradually hauled round by north to south-west.

The afternoon turned out very dull and misty, and brought out the dangers of the navigation. After passing the north-west end of Quoin Island, the tide seemed determined to set us out of the right channel, so that our proper course being about south, we had to steer west and north-west to keep our position. Here the water became quite calm and as smooth as glass, though a good breeze was blowing aloft, giving us 4 or 5 knots' way through the water. We had been able hitherto to fix our position by angles and bearings to table and fossil hills, and part of McAdam Range, but they now became miraged, and presented a continuous level surface. Quoin Island and the low land on the west side of the river disappeared altogether, even from the masthead, though we knew they were only two or three miles off on either side. Luckily River Peak hove in sight, and the north end of Quoin Island was lifted, so that we saw it a distance of 12 miles. After getting a few shoal casts of  $2\frac{1}{2}$  fathoms, we anchored between Observation Island and the mainland in 7 fathoms, and about 1 mile off the latter. Here the flood-stream ran at least 6 knots per hour. The position of Observation Island we never made out either going up or coming down the river: it must be very low.

Next morning we had a fine breeze and clear weather, and could make out all the hill-marks, and the place where the river enters the range, and the mangrove-shore on each side presented a very narrow green line. The flood-tide then running enabled us to work up to Blunder Bay, where we came to in 5 fathoms, just as the tide turned. As the schooner was out of the strength of the tide here, and the anchorage seemed good, she was to stop here in preference to Holdfast Reach, where we might, like the *Beagle*, lose our anchors. At Blunder Bay we were completely surrounded by hills, most of them looking quite bare, and covered with immense rocks; and though some of the hills to the eastward were well wooded, a near approach showed the timber to be small, and the hills all rocks and stones.

Taking advantage of the flood, the Government Resident and myself started up the river the same evening in the *Julia* and gig. We reached Black Point, and brought up for the night at 9 P.M. Several natives made their appearance in Blunder Bay before we started, and as we passed Holdfast Bay the country was on fire on both sides of the river, and the boats were hailed by the natives.



We were prepared to be alarmed at Whirlpool Reach, it being now spring-tides, but being accustomed to the narrows of the Adelaide River, to us Whirlpool Reach seemed hardly to deserve its name, and we felt rather disappointed.

Next morning we proceeded up the river with a fresh south-east wind, and made good progress. The scenery was certainly very striking, but the rugged, barren ridges did not look well for a settlement. We saw the gouty-stem trees for the first time when rounding the high rocky point north of Shoal Reach, in which reach the *Julia* had her first little difficulty with some shoals, but soon got clear with the rising tide. As we advanced along the next reach, which trended E.N.E., the country seemed to improve; the sandstone ridges on the north side, though very broken and precipitous, were clothed with grass, and the south side of the river was low grassy land, gradually rising. We landed up a small creek on this side and walked about half a mile inland. The country was covered with small timber and well grassed. This being the dry season the grass was all withered, but looked of a finer quality than that on the Adelaide.

We passed Mosquito Flat at high water and so got over the shoals, but with barely enough water for the *Julia*; and after getting a little bothered among the banks off the mouth of the large creek, east of Curiosity Peak, we came to in 2 fathoms, close to a detached hill, south-west of the Dome.

The cliff on the chart close to our anchorage is merely a perpendicular earthy bank, about 6 feet above high water. During the afternoon I went up the adjacent hill, about 600 feet high; it is long, very narrow, and with high cliffs surrounding its summit. I had a good view over Mosquito Flat and the Whirlwind Plains; the former was a mere mangrove-swamp, with some grassy land inside toward the foot of the hills; several creeks intersected the flat and drained it, and the dry part had very evident water-marks across the surface. A rise of a few feet only would send a stream across the flat, from the Victoria; former marks showing that the water would come in between Dome and the hill we were on.

Turning toward Whirlwind Plains, the part nearest us seemed very little above high-water mark, but the country having been lately burned, the grass looked green and pleasant; beyond 3 or 4 miles the plains presented the appearance of a dense scrub, which appeared to extend to the south-east as far as the next range. The hill on which we were was nearly devoid of vegetation, except on its summit, which was flat, and at each end of sufficient width to grow some small trees and a few tufts of grass; just under the perpendicular cliffs round the summit were some tall fan-palms. The flood tide seemed to have some difficulty in getting past the shoals off Mosquito Flat, for we did not get it till

2 P.M. next day, when we started, and passing along the foot of sea range, opened out on the long reach through which the Whirlwind Plains run, down which we proceeded about 3 miles, when we came to. The plain at the foot of the sea range was low, and covered with coarse grass very like that on the lower plains of the Adelaide; on the opposite side of the river was a long earthy or sand cliff crowned with an open scrub of small white-stemmed gum-trees.

The general appearance of the Whirlwind Plains was very different from what I had expected; instead of open prairie-land, covered with grass and with hardly a tree in sight, wherever I landed, which I did repeatedly, I found myself in what I should term an open grassy forest; the timber of which it was composed being almost invariably the peppermint-gum common in South Australia; the greatest height which it attained here seemed about 40 feet. The soil was of a deep brown colour and sandy nature, and getting much lighter in colour beneath the surface. The above description does not apply to more than half a mile inland from the river on either side, as I did not go beyond that distance at any time, and the wood was too thick to see more than 200 yards' distance.

The river, in the long reach, was about 300 yards wide, and with scarcely any tidal stream, and about 2 feet rise. The east side was generally clifty, showing the nature of the soil very well, and the west bank was fringed with a narrow, even wall of mangrove-scrub about 15 feet high. Several very large gouty-stem trees grew on the bank. On cutting into one with an axe, I found the interior very soft and juicy, or spongy, and quite white. I got a very good drink by sucking and chewing a large piece. It tasted like the juice of a ripe cocoa-nut. We obtained some of the fruit, which was the size of an emu's egg, with a green skin like that of a quince, but quite hard, and about a tenth of an inch thick, inside which was a solid white spongy mass, quite dry and full of seeds—this had a sweetish taste. I have no doubt this fruit is very good if gathered when just ripe; but those we got were evidently last year's, all the trees being without a vestige of foliage. Stokes says too, they were in blossom in November. The plains near the river seem much cut up by watercourses in all directions.

Nearly opposite the cone "White Cliff" on Stokes's chart of the river, is a pebbly point behind which we came on a creek, which, from the trees growing in its bed, must run with fresh water in the rainy season—some of the men found a little. The white cliff opposite appears to have obtained its name from the grass growing down its face, which at this time of year would appear quite white by moonlight; but where it had been burnt off this cliff was exactly like the others; several pieces of lime-

stone were picked up hereabout. Sandy Island has a long pebbly spit off its south end, on which several of the men picked up some very pretty pieces of stone. As we advanced up the river the banks seemed to get higher, and, for some miles before the Whirlwind Plains cease, were nearly 50 feet high.

On the 26th we left Whirlwind Plains and again were pulling along between hills; they were very stony, but covered with grass and wooded with peppermint. At 8 P.M., whilst towing the *Julia*, we both came suddenly on a ridge of rocks, and, after getting clear, came to for the night; we were about 2 miles below Steep Head. On the morning of the 27th I landed on the south bank, and was surprised to find the watercourses full of limestone lumps, and afterwards to see the soil covered with small pieces of the same. I walked across the plain to the foot of the hills—dark sandy soil, with a variety of stones, including some large pieces of red jasper; the grass was thick, and, apparently, of very good quality. The country had not the cracked appearance of the Adelaide, but the rain seemed to collect in watercourses and drain off into the river.

After breakfast we succeeded in getting the *Julia* about half a mile further up, when she again struck, so, seeing it would be useless to attempt to get her any higher, the Government Resident came into the gig, and, in company with the *Julia's* dingy, started for as far up as we could get.

Steep Head soon came in sight, its black face composed of laminated sandstone placed in horizontal strata. After landing to examine it, we proceeded for a short distance to where we came to a series of rocky bars extending nearly half a mile, over which we dragged the boat, and came into a fine deep reach, where the water was only slightly brackish, and a little rain higher up would make quite fresh. We pulled on through a reach about 100 yards broad, and looking like some of the upper reaches of the Adelaide, but wider. We pulled past an island, which leaves only a very narrow channel, just wide enough for the oars on its north side, and soon afterwards had to stop at what we supposed to be Palm Island—the river here coming to an abrupt termination as a continuous stream. The water here was quite fresh, so we filled all our breakers, the dingy also filling those she had brought from the *Julia*. The bar across the river here was composed of shingle, some of the stones being of large size. A number of trees grew in the bed of the river, mostly tea-trees, some of large size, also plenty of palms and small scrub. Most of the tea-trees, though of large size, were inclined at an angle of 45° with the water, in the direction of the stream, showing a powerful rush of water at certain times. I went on to the next reach, separated from the lower water by a bar about 30 yards across, composed of

rock and shingle, and had a quiet bathe some distance up, though not without some fear of alligators, as we had seen one just outside. The last reach reminded us very much of the Adelaide, having the same kind of willow-like paperbark or tea trees overhanging the stream; the palms and reeds also seemed to be exactly the same. We saw, however, no bamboos in the whole course of the Victoria to this point; the land here, too, was much cut up by watercourses; the hills came close to the river and were very high and remarkable in form, steep and rocky, but covered with grass.

We returned to the *Julia* in the evening after a little difficulty in getting the boat over the rocky bars. Some of the men thought the water had fallen a few inches, but I could see no difference, except that the boat was deeper by 30 gallons of water. The stream was running down over the stones at 9 A.M., and the same at 4 P.M.

On the morning of the 28th we started down the river with a fresh south-east breeze, and this being the first fair wind we had had, we made good progress. Nothing of interest occurred until 2 P.M., when on entering the Mosquito Flat Reach, and apparently in the centre of the channel, the *Julia* went on shore. The river had evidently been shoaling up since Captain Stokes' survey, as he had one fathom marked at low water, where we walked about quite dry at half tide; in fact, before we left, it was possible to walk right across the Victoria here at half tide from Mosquito Flat to within about 100 feet of the south shore without getting wet feet—myself and many others did it. Close to the south shore, however, existed a narrow channel of from 3 to 5 feet water, at low-water neaps. This, however, is the channel of the Wickham Creek, and at low-water springs can have no connection with the Victoria Proper. After we left her, each tide got lower, until the flood never reached her at all, and she was left high and dry during a whole day; showing that only the spring-tides reach above Mosquito Flat. On our arrival on board, on the 31st, with the Government Resident, I sent Mr. Guy up to the *Julia* with a good supply of fresh water, and was very glad to see both boats back on the evening of the 3rd of September. A stiff sea-breeze had sent up a high tide the previous day, and enabled the *Julia* to float off.

During the absence of the boats, the schooner had experienced very hot dry winds from south-east, causing leaky decks, &c.; in fact, the same winds that blew cool to us up the river, having to come over many miles of hot burning naked rocks, became heated to almost the temperature of an Adelaide hot wind. Two or three cases of fever had occurred on board, and my boat's crew and self suffered from sore eyes, which soon got well when we got outside. We had been able to get a plentiful supply of very good firewood

from Entrance Island—a sort of resinous pine, with hard sound wood of a teak colour. This leads me to remark that the mangroves of the Victoria River are mere brush generally, not growing to a height of over 6 feet, and of no use whatever as firewood. The writer of the ‘Handbook of the Northern Territory’ must have been thinking of the Adelaide River, where the mangroves grow tall and straight like pines, and to a height of 80 and 100 feet without a branch, when he mentions the mangrove-forests at the mouth of the Victoria; the fact being that the said forests are hardly visible from a ship’s deck at 4 miles’ distance. I have generally found that sand kills off the mangrove-trees altogether, and from its mouth to Palm Island the banks of the Victoria are sandy.

As a navigable river, I consider the Adelaide to be far superior to the Victoria. In the former, a vessel of the size and draught of the *Beatrice* can ascend nearly 80 miles, into fresh water, with perfect safety. In the Victoria, the same vessel could not get much farther than Holdfast Bay, without great risk; and Mosquito Flat, at this season, is not passable by large boats except at spring-tides. There is a great difference in the soil of the two rivers, the Adelaide being clayey and muddy, and the Victoria sandy. I do not pretend to have any idea as to which is the best for this climate, but the land about the Victoria certainly looks the best, that is, above Mosquito Flat. I notice one great difference: whereas the water which falls on the plains of the Adelaide appears to remain stagnant, until dried up by the sun or filtered through the soil, the rainfalls on the Whirlwind Plains, and above them, seems to run at once off in violent torrents—which cause the numerous small but deep watercourses I have spoken of before.

On the morning of the 4th of September, we ran from Blunder Bay, with a fair wind, in company with the *Julia*, and got as far as the point off Forsyth Creek. The same evening, the tide having risen 22 feet, the *Julia* left us to make the best of her way back to Escape Cliff, the Government Resident going on with us to Timor.

XVII.—*Notes on the West Coast of Madagascar.* By Captain  
J. C. WILSON, R.N.

THE Island of Madagascar is little known except through the excellent works written by the Rev. Mr. Ellis; and in those works we find but slight mention of the western coast, which I purpose to form the subject of this paper.

From the geographical position of the island, lying as it does across the trade-winds, the climate and general features of the east and west sides materially differ. The west is peopled by the Sacalava tribes, who may be looked upon as quite as distinct a

nation from the Hovas as the Norwegians are from the Swedes. The trade-wind seldom blows home with any great strength; which is fortunate, as the east coast is very deficient in sheltered harbours (if we except the bays at the north-east end), the best being only protected from the sea by reefs, but exposed to the wind. The wind gradually trends in the direction of the land, as you near the extremes of the island, blowing with such force round Cape Amber, that vessels seldom attempt to face it. The current divides in about  $18^{\circ}$  s., one part taking a northerly direction along the coast, sweeping past Cape Amber at the rate of 3 knots an hour, forming a southern eddy down the western shore, and the other running, though with less velocity, round Cape St. Mary's. The east coast is often stormy, and generally wet, being the weather; whereas the west is calm and dry, being the lee shore. The latter is also thickly fringed with fine harbours and bays, though as yet but imperfectly surveyed, and but little known. The Hovas are nominally the dominant race, but the Sacalavas are, in fact, quite independent; and the only military post held by the former along this coast is a fortress of no great importance, situated so as to command the entrance of Buubatooka Bay. The town of Majunga lies at the foot of the hill on which this fort stands, and is commercially the most important on the coast. From this, several cargoes, consisting of ebony, logwood, rosewood, beeswax, hides, and other valuable articles, are yearly exported in American and Hamburg vessels; a considerable quantity is also carried to the Bombay market by dhows.

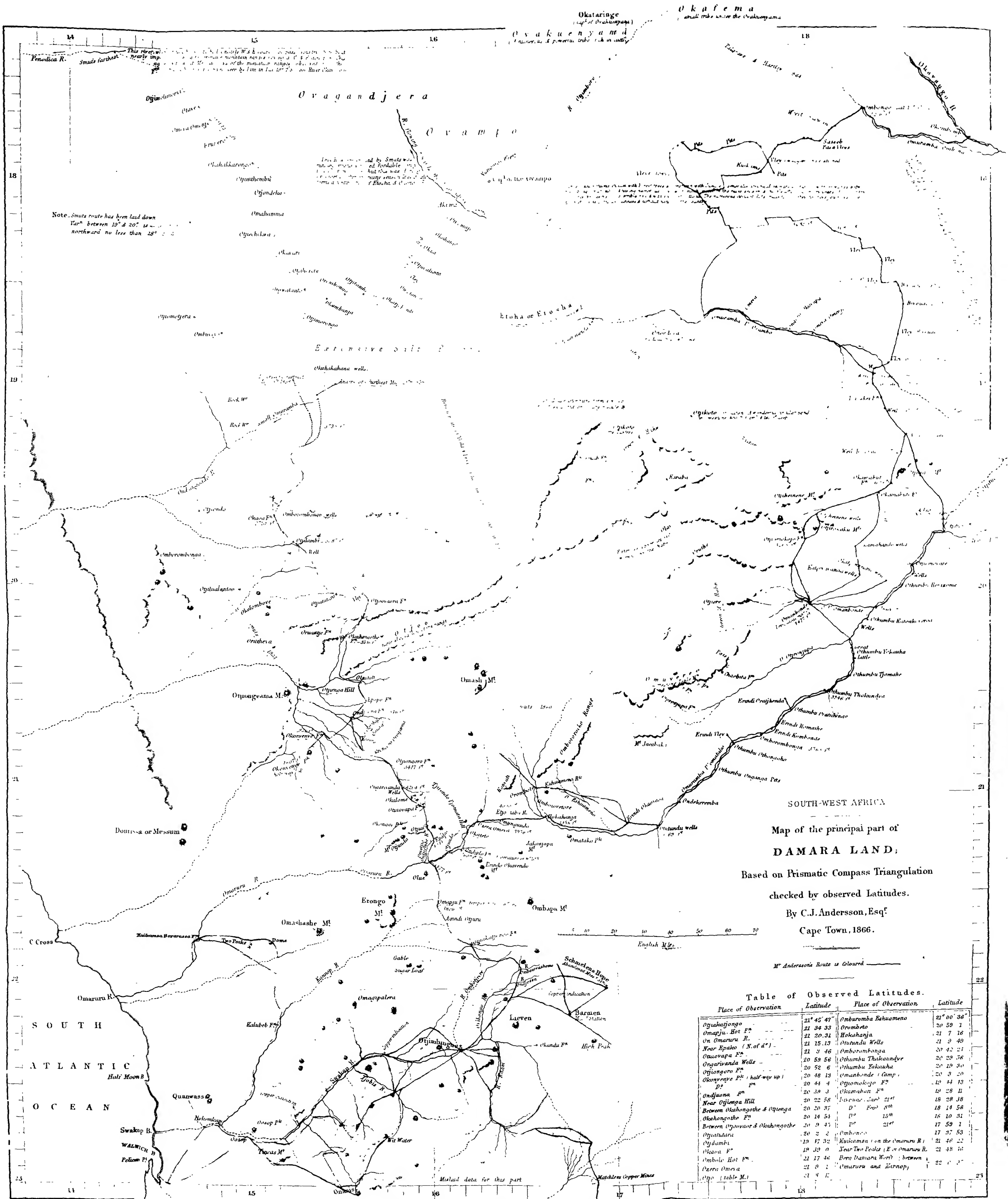
The French likewise have a brisk trade between the different ports and their military colonies of Nos Beh and Mayotta; and some enterprising merchants have from time to time taken up their quarters on the coast. When last I visited St. Augustine's Bay (on the south-west end of the island), we found that a flourishing trade in salted beef had been opened to supply the Bourbon and Mauritius markets; and, from the cheapness of cattle, it must have proved a highly remunerative speculation. Hides are not so plentiful as might be expected, owing to the custom amongst the natives of cutting up and selling their meat with the skin on. The import slave-trade is still carried on (though to no great extent) from the East Coast of Africa in Arab dhows. These vessels take in their slaves probably somewhere about Angora River, cross over to Cape St. Andrew's, and exchange them for cattle (at the rate of four head of cattle for one slave) with the neighbouring petty chiefs; these are again sold to the French, at Nos Beh, after which they go to Ozsanga (a fine large bay and river abreast of that island) and load with rice, which cargo is taken to Zanzibar or Quiloa; if to the latter port, they would probably add a number of slaves for Zanzibar or the north.

The Sacalavas are the finest race of savages I have ever seen, being superior to the Hovas in appearance, but not nearly so intelligent. They are strongly built, tall, independent fellows, with the African cast of countenance, though generally much better looking. All carry the flint-musket, which is most carefully kept, the stock highly ornamented with brass nails, and well polished. As enemies they are not to be despised, being capital shots, as the French well know from experience on more than one occasion. Large quantities of rice are annually grown and exported, more particularly from the marshy country about Ozsanga River; but on the whole the natives are more pastoral than agricultural in their habits. The houses, like all others I have seen in Madagascar, are beautifully clean and comfortable, and constructed like those on the other side of the island. Morality here is at a low standard, virtue being unknown amongst women; though it must be said, that when married they are constant to their husbands. It is strange that this deplorable state should be so universal throughout this beautiful island, and that, though in many respects superior to other coloured nations, in this they are so far beneath them. If the French carry out their long-cherished desire, of making Madagascar a dependency, I am convinced that Bembatooka Bay would be the point from which they will penetrate into the interior. A few thousand troops, assisted by the North Sacalavas, who could easily be induced to join them, would, without much difficulty, march on the capital (Tananarivo), from whence they could govern the island with ease. Tananarivo is situated on the highlands, and therefore most healthy. Majunga (in Bembatooka Bay) is the nearest point (where troops could be disembarked) to the capital, possessing a safe and commodious anchorage, and the country round about capable of furnishing large supplies of provisions. From the imperfect way in which the coast has been surveyed, it is most dangerous to navigate; and past experience teaches us that, in the event of shipwreck, the natives are not to be trusted. Steamers ere long will open up this part of the world, when the value of Madagascar will be fully appreciated. The coal-beds known to exist on the north-west end of the island, and situated at no great distance from the fine harbours before referred to, will then become valuable, and one great difficulty in the navigation of the Mozambique Channel overcome. In these days of cattle-plague may we not take a hint from the enterprising French trader, and establish factories where beef could be salted for our home market? I believe it could, with advantage to the speculator and this country generally.

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XVIII.—*Notes to accompany Mr. C. J. ANDERSSON'S Map of Damara Land.* By THOMAS BAINES, Esq.

As no descriptive paper accompanies the very carefully drawn maps of Damara Land sent home by Mr. C. J. Andersson, I may be permitted, as one who has enjoyed his friendship and hospitality, and as having travelled myself in the same region, to offer a few remarks in elucidation of the subject.

Mr. Andersson first visited the Cape in 1850, in company with Mr. Francis Galton, who, I believe, intended to penetrate far into the interior by the usual route, *i. e.* through the Eastern Province and by way of Kuruman to Lake Ngami; but hearing that the emigrant Boers in the Trans-Vaal country had prevented several travellers (among whom were Mr. Joseph Macabe and myself) from passing to the interior, they determined to sail for Walvisch Bay, and attempt to penetrate inland from the west coast.

The travellers succeeded in reaching Ondonga, in the Ovampo country, and, after Mr. Galton had returned, Mr. Andersson renewed the attempt to reach Lake Ngami, and not only succeeded in doing so, but also ascended for many miles the Tēoghē, which flows into it from Libēbē's country to the north-west.

He next traversed and mapped the route of the cattle-traders through Namáqua Land towards Cape Town, and subsequently accepted the superintendence of the copper-mines first worked on the Swakop and afterwards on the Kuisip rivers by a Colonial Company.

In the beginning of 1859 he again set out northward, hoping to reach the Cunēnē or Nourse River, the mouth of which, in the Atlantic, is in about 17° s. lat. and which had been discovered in 1824. On the 22nd March, 1859, he succeeded in reaching a great northern river.

It was a noble stream, 200 or 300 yards broad, of great apparent depth, with a current  $2\frac{1}{2}$  or 3 miles per hour, not flowing to the west but to the eastward, or towards the centre of the continent, instead of to the coast. He naturally concluded that this could not be the Cunēnē, but the Chobe River. Mr. Andersson first reached the river in 17° 30' s. lat. and longitude about 19° E. He descended it in canoes about 40 miles south-east, to visit the paramount chief Chikongo, and afterwards traced it up to about a degree above where he first struck it. The opinion he formed, by his own examination and the reports of natives, was that the waters of the Okavango must form the westernmost branch of the great Zambesi; the channel of the Tēoghē, given off at Libēbē's Island, being too small to receive more than an inconsiderable portion of them.

The sources of the river Mr. Andersson learned were 20 days' journey to the N.N.W. (probably 150 to 200 miles), and this would considerably contract the limits assigned to the probable course of the Cunēnē River.

Worn out with toil and fever, Mr. Andersson was eventually relieved by the generous exertions of Mr. Frederick Green, and for some years after resided at Otjimbenque, where his home imparted an air of civilisation and even of refinement to the village he had established.

Mr. F. Green has since succeeded in reaching the Cunēnē River from Damara Land, in July, 1865, 170 miles W.N.W. from Ondonga. It surpassed the Okavango in the beauty of its scenery; the latter flowed clear and dark-blue like the sea, through a level country with low banks, bordered by reeds or corn-fields, and with comparatively few trees; but the Cunēnē, somewhat turbid from the soil it passed over, glided smooth as mirror between forest-clad banks—the trees, especially when islands divided the stream, over-arching and sometimes nearly meeting across it.

Mr. Green supposes the Okavango and the Cunēnē to have a common source in the marshes of the elevated plain of the interior; but the Cunēnē, then running about  $2\frac{1}{2}$  miles an hour, and occasionally rising as the flood-marks showed 15 or 20 feet higher, soon reached the mountain-gorges to the W.S.W., down which it must rush with greatly accelerated velocity. He reached a spot only 15 days' journey distant from Mossamedes or Little Fish Bay; but he did not risk the descent with waggons through so mountainous a country.

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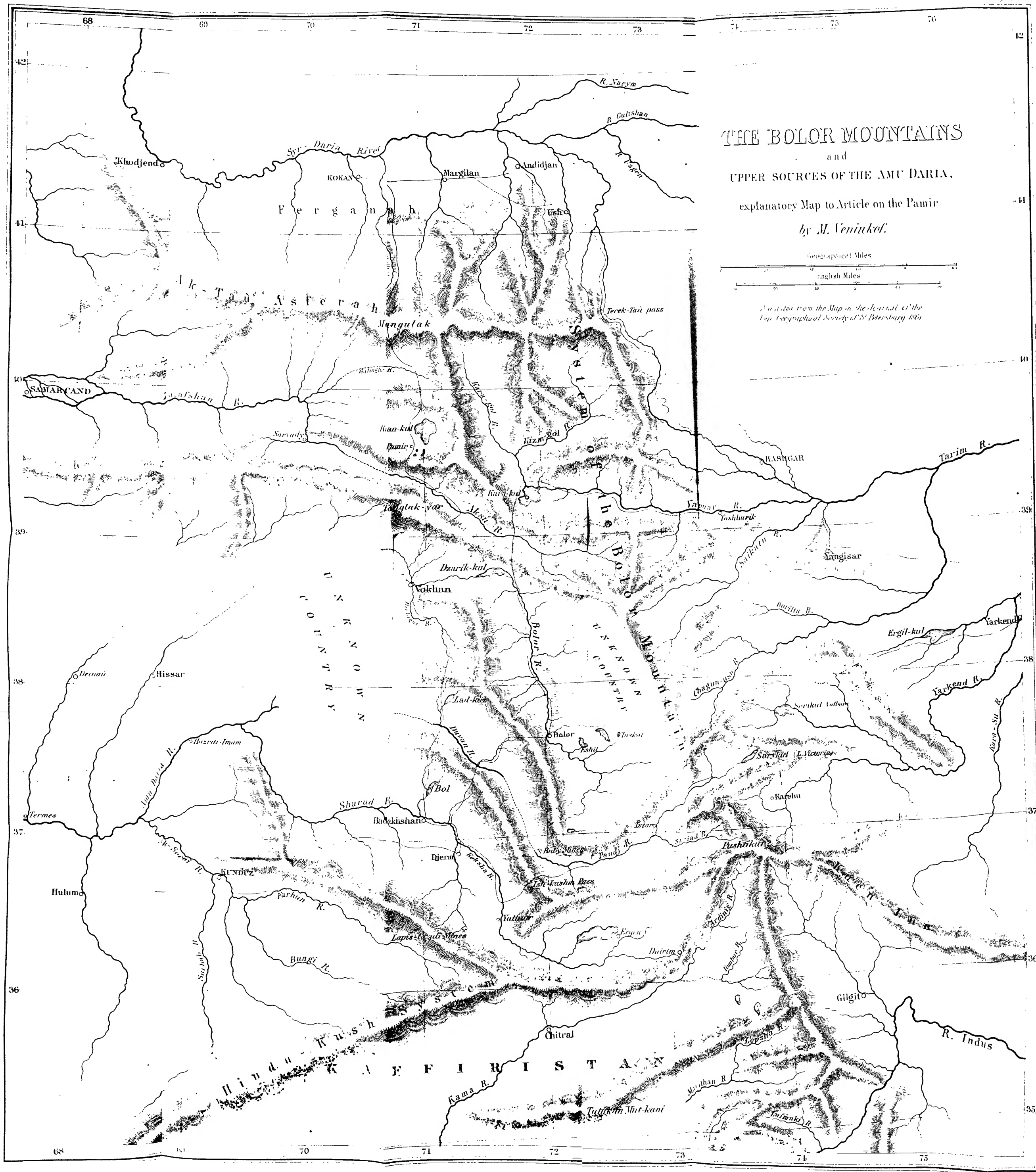
XIX.—*The Pamir and the Sources of the Amu-Daria*. By M. VENIUKOF. Translated, for the Royal Geographical Society, from the 'Journal of the Imperial Geographical Society of St. Petersburg, 1861,' by J. MICHELL, Esq.\*

It has been very truly observed that the surface of the moon is better known to us than many parts of our own planet. Of this fact we may be easily convinced by comparing Behr and Medler's admirable map, or some of the clear photographs of the moon with the delineation of some parts of our globe. Science freely penetrates into the distant expanses of the heavens, but meets with insuperable obstacles to its progress on earth, where

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\* This and the following (Art. XX.) are the memoirs discussed by General Sir Henry Rawlinson, in his discourse on the travels of Georg Ludwig von ———, published in the 'Proceedings,' vol. x. p. 134 *et seq.* See also Letters of M. Khanikof, Extracts from the Journal of Georg Ludwig von ———, and Observations by Lord Strangford, 'Proceedings,' vol. x. p. 301 *et seq.*





the enmity of human races often renders whole regions inaccessible. The table-land of the Pamir, the Bolor Range, and the sources of the Oxus, are localities which answer to this description. From the sources of the river Koshkar, the extreme point of Russian survey, to Peshawur and the adjacent country under British dominion, the distance is not above 600 geographical miles, *i.e.*, a smaller interval of space than that existing between St. Petersburg and War-saw; and yet we do not see the slightest prospect of the geography of this region being cleared up. The political condition of the inhabitants of both slopes of the Bolor is too hostile to be favourable to the peaceful aspirations of geography, and it is only by the thunder of artillery that the geographical gloom which envelopes the extensive uplands of inner Asia may successfully be dissipated.

An attempt on my part to elucidate the geography of a region to which even Ritter and Humboldt could give no distinct delineation would appear an act of unpardonable temerity. One circumstance will, I hope, exonerate me from any imputation of boldness. In the spring of 1859, when preparing to start on one of my expeditions into the interior of Asia, I chanced by good fortune to light on two very important sources of information relative to the geography of the Bolor, the existence of which has apparently been unknown to European and to our own native geographers. With the assistance of these new materials we shall, I hope, be able partly to unravel that gordian knot of geography which twenty years ago formed the subject of a paper contributed by one of our travellers, Mr. P. Chihachef, to the *Memoirs* of our Society. Before describing the new sources of information discovered by me, I shall first make an extract from Humboldt's '*Asie Centrale*' with reference to the Bolor, in order that it may be more clearly seen in what the principal geographical questions relating to this region really consist, and to what extent the newly discovered materials are able to supply answers to them. As was truly said by the great Arago, a question properly put is already half solved; and where is this question of the Pamir more clearly set forth than in the pages of Humboldt's classical work?

"The chain of the Bolor, particularly that portion of it which chiefly bears this appellation, and is situated between  $36^{\circ}$  and  $40\frac{1}{2}^{\circ}$  lat., forms at present the natural boundary of China on the west. Commencing from the Terek-tau and the Tian-shan, or from the Pamir plateau to Badakhshan, colossal mountain ranges present insurmountable difficulties to the passage of military forces. Twice only—that is, once during the Han dynasty, contemporary with the Roman Republic and Tiberius, and once during the Han dynasty, coeval with the reign of Charlemagne—were the efforts of the Chinese to penetrate into the fertile valleys of the Oxus and Jaxartes crowned with success.\* More

\* Towards the latter part of the last century the Chinese were also masters of the Bolor and Badakhshan, though not for long.

than a hundred years before our era, during the reign of the Emperor Wu-di, at the time of the wars with the Huing-nu, Ferganah became a Chinese conquest, and remained in that condition for some time. The diminution in height of the Bolor at its northern point of prolongation, and after its intersection by the Asferah range, renders the passage from little Bukhara into Kokan comparatively easy.

"The etymology of the word Bolor, varied also into Belur, is as unsettled as that of the greater part of the mountain chains and large rivers. . . . The town and kingdom of Bolor, at the sources of the Oxus, are of ancient date. In the year 640 a.d. the Buddhist traveller Huen-Tsan says: 'To the south of the Pamir valley, after crossing a mountain, one reaches the kingdom of Bo-lo-lo, which produces much gold and silver.'"

This allusion to the wealth of the Bolor serves to explain the discovery of auriferous sand in the Oxus, although Humboldt is of opinion that the birthplace of the gold is on the eastern slope of the range.\* Even in the middle of the eighteenth century, during the reign of the Emperor Tsian-lun, the Jesuit Felix D'Arocha placed the Bolor (Po-lo-euth) as one of the points on the list of his astronomical determinations. There is also a river called the Bolor, which after a curving course through Vokhan becomes one of the sources of the Jihun.

"The appellation of the Tsun-lin, or Onion Mountains, belongs properly to the intersection of the Bolor and Kuen-lun ranges, and particularly to the northern and eastern portions of the mountain knot. The Chinese, however, extend this designation not only to the whole of the Bolor, but also to the eastern part of the Hindu-Kush. Huen-tsan, for instance, applies the name of Bolor to the town and kingdom, while he calls the mountain chain Tsun-lin. The Buddhist priest Fa-hian, the predecessor of Huen-tsan by 240 years, and the author of the Foe-kue-ki, only passed through the southern part of the Bolor when proceeding from Kokan to Ladakh. 'The kingdom of Ladakh,' he says, 'lies amidst the Tsun-lin Mountains.' It is supposed that he speaks here of a part of Baltistan, generally called little Tibet.

"The uninterrupted prolongation of the meridional chain of the Bolor commences from the parallel of  $32\frac{1}{2}^{\circ}$  to the south of its intersection by the Himalayas, Kuen-lun, and Hindu-Kush, to  $45\frac{1}{4}^{\circ}$  on the north of its intersection by the Tian-shan, which range here respectively receives the names of Asferah, Kipchak, and Terek-Tau. The chain thus extends over a distance of 860 miles (1300 versts). The dominating points probably rise above 18,000 feet, and are situated between  $35^{\circ}$  and  $40^{\circ}$  lat., occurring particularly at the knots, with the ranges extending parallel with the equator. The southern knot especially is of colossal proportions both in breadth and relative altitude. The wonderful labours of Elphinstone and Burnes, in conjunction with the daring explorations of Lieut. Wood and Dr. Lord, have made us acquainted with this region of marvels.

"The extension of the Bolor chain, and its range from north to south, were well known to the traveller Huen-tsan. He asserts with great distinctness that 'the Tsun-lin Mountains abut on the south on the great snowy range (the Hindu-Kush), and reach on the north the Warm Sea (Issyk-kul) and the Thousand Springs, or Min-Bulak.' The addition of this latter remark would apparently establish the continuity of the range to the sources of the Kazyurt, which intersects Minbulak and the Kendyrtau range. In order to fix the

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\* Allusion to one of these birthplaces of gold will be made hereafter.

direction of the axis of the Bolor I was obliged to rest this axis eastward on Kashgar and Yarkent, and westward on Cabul, Bukhara, Kokan, and Tashkent. The accuracy of these astronomical positions is very unequal, and the danger of error is all the greater, inasmuch as we have to deal not with a chain that runs parallel to the equator as the Tian-shan, where the latitudes are of moment, but with a meridional range, the determination of the position of which will be greatly influenced by errors in the longitudes. In the greater portion of the recent maps of Asia the results obtained and published by Father Felix D'Arocha are to a great extent disregarded, even in the matter of longitudes. It is my opinion that in the advance of new astronomical determinations in this region the old points must be adhered to."

By comparing various data, Humboldt arrived at the conclusion that the axis of the Bolor forms with the meridian an angle of  $9^{\circ} 16''$  to the west, and that its position through the parallel of  $32\frac{1}{3}^{\circ}$  may be fixed in longitude  $91^{\circ} 50'$  E. of Ferro; through parallel  $40^{\circ}$  in long.  $89\frac{3}{4}^{\circ}$ , and through parallel  $44^{\circ}$  in long.  $89^{\circ} 25'$ , where the Kaz yurt terminates.

"The chain of the Bolor, like the greater part of all long ranges, consists of smaller parallel chains divided from each other by high valleys and plateaux. This fact is established by the details of the description of the three great passes through the Bolor. The most northern of these passes leads from Yarkend and Kashgar to Kokan. Caravans laden with tea, destined for the market of Bukhara, leave the region watered by the tributaries of lake Lob-nor and cross two mountain chains before reaching the basin of the Syr-Daria and the Aral Sea. The first mountain pass on this difficult route, which runs from south-east to north-west, occurs at that portion of the Celestial Mountains called the Tei-ek-tai. This is the Kashgar-davan pass, which many geographers have converted into a mountain chain. After clearing this first barrier, which runs from east to west, caravans proceed through the northern prolongation of the Bolor, between Ush and Andidjan, which is situated on the left bank of the Syr-Daria. This route from Bacriana beyond the Imaus through the 'stone tower' was known at a remote period. We are able to trace this route by two march-routes of a recent period." [The march-route of Mir-Isset-Ulla, from Kashgar to Kokan, *Klupproth*, 'Mag. Asiatique,' t. ii., and a Russian march-route from Tashkent to Kashgar, placed at Humboldt's disposal by Count Cankreen.] "Beyond this pass southward there is the Pamir pass, which extends through a continuation of the Bolor to the north of its intersection by the Asferah range, approximately in lat.  $41\frac{1}{2}^{\circ}$  ( $37\frac{1}{2}^{\circ}$ — $32^{\circ} 5'$ ?). The next pass is that which was traversed by Father Goetz, in 1603, when proceeding from Karshu through Sukul and Yarkend. Ritter was the first to direct attention to the route of the Jesuit missionary from Karshu, which lies—if we adopt as a basis Lieut. Wood's observations on the sources of the Oxus—approximately in latitude  $37^{\circ} 10'$ . The Pamir Pass—a description of which is extant from the 6th century—is the most celebrated in the whole of the Bolor Mountains. The division of the range into subsidiary chains becomes visible here in the difference of climate and form of vegetation; and this division is so apparent that Macartney, in his beautiful map attached to Elphinstone's journey, distinguishes the chains of the Pamir, Bolor, and Badakhshan. The Buddhist traveller, Son-Yun, who crossed the Bolor in a direction from east to west after leaving Khotan, speaks of two chains, the eastern of which he calls the Great Tsun-Lin.

"It now remains for me," continues Humboldt, "after giving a general sketch of the Bolor, to dwell more particularly on the principal mountain heights of the region. It is only impossible to say whether these elevated points rise



immediately out of the range or whether they occur at the side of it. Between Gilgit and Chitral, that is between the intersections of the southern and northern Hindu-Kush, rises the colossal peak of Tutukan, which, judging from the angles of elevation from some distances, is not less than 3200 toises in height (according to Elphinstone); this peak occurs in the eastern part of the Bolor, in latitude 35° 25'. One degree northward of this peak, and nearly under latitude 37°, between Kaishu and Vokhan, is the Pushtekhar group,\* which extends from S.S.E. to S.N.W.; but however colossal this group may appear, it forms only the girdle of an upheaval still higher, known under the name of the Pamir, and celebrated throughout the whole of Central Asia as a mountain to which all other snow-capped mountains must in comparison be considered low."

Turning then to descriptions of the Pamir, Humboldt alludes to the observations of Burnouf, and to Neumann's translation of 'Son-Yun,' citing then Huen-tsan, who says:—

"The Pamir Plain extends 1000 li from east to west and 100 li from south to north; it is situated between two snowy mountains. Grain is sown there, but everything grows badly. In the middle of the plain is the Dragon's Lake, the waters of which are dark green, and full of tortoises, sharks, crocodiles, and dragons. Foxes, swans, and wild ducks frequent these waters. To the west of Dragon's Lake† there issues a large torrent which flows towards the Oxus; another torrent, which flows towards Kashgar, issues out of the lake on the east. To the south of the Pamir Plain, after crossing the mountain, lies the kingdom of Bolor, where much gold and silver are procured."

In the interval between Huen-tsan and Wood (1838), the only traveller who visited these parts was Marco Polo. This enterprising man may have crossed over the Pamir in 1277, but it is difficult to ascertain from the account he gives whether he did actually traverse the plateau. From the phrase "it is said," which he uses in his description of the Pamir, it must be concluded that he did not visit this locality himself. He was detained by illness a whole year at Badakhshan, and from this place he might easily have reached Kashgar by crossing the Bolor in a more southerly direction than that followed by Father Goetz. In every case his description of the Pamir is exactly similar to that given by Huen-tsan and Wood; the latter especially coincides with him in the smallest details.

"Proceeding from Badakhshan to the north-east and east," says Marco Polo, "one reaches, after passing several small castles along the bank of one river, the province of Vokhan, the inhabitants of which profess Islamism. Journeying three days more in an easterly and a north-easterly direction one arrives after a prolonged ascent at the summit of a range of mountains which they say are '*il più alto luogo del mondo*.' When the traveller finds himself in this place he sees between two mountains a large lake, out of which issues a fine river. The plain yields such fine pasturage that the leanest cattle get fat in ten days."

In these mountains Marco Polo did not see any birds, whereas

\* Vide Addenda, I.

† Ibid., II.

Wood says that the lake was covered with them, which agrees with the account of Huen-tsan.

"In spite, however, of the striking similarity, topographical and physical, between the accounts of Son-Yun (518), Huen-tsan (629-645), Marco Polo (1277), and Lieutenant Wood (1838), the geographer seeking to ascertain the position of a point is never sure of the identity of any locality. He is at a loss to know whether the designation of the Pamir belongs exclusively to one plain, which Huen-tsan calls Po-mi-lo, or to the whole of the extensive plateau taking twelve days to cross, as stated by Marco Polo. The Venetian traveller, like Huen-tsan, says at the end of his description that to the south of the Pamir is 'Belora,' but he does not mention that the plateau of the Pamir forms the water-parting between the basins of the Oxus and Lob-Nor. Marco Polo visited the province of Vokhan, and it is surprising that he did not learn that the 'fine river' flowing out of the alpine lake was the Oxus, the same river that forms the limit of Vokhan, on the north. The western extremity of Sary-kul Lake, which is one of the sources of the Oxus, is situated, according to Wood, in lat.  $37^{\circ} 27'$ , and long.  $91^{\circ} 20' E.$  of Ferro. According to the accounts gathered by Macartney during Elphinstone's memorable expedition, two other lakes exist in the zone of the Pamir, namely, Kara-kul, in lat.  $38^{\circ} 50'$ , and Surik-kul, in lat.  $39^{\circ} 10'$ , marked on Macartney's map considerably to the northward of the principal source of the Oxus, which is placed in lat.  $38^{\circ} 10'$ . Macartney shows no outlets from these lakes, situated, one  $1^{\circ} 23'$ , and the other  $1^{\circ} 43'$  to the north of the Sary-kul of Wood. The excellent map of John Arrowsmith, constructed in 1834 for the work of Alexander Burnes, does not altogether agree with the statements respecting the Pamir in the text of Burnes' work. 'The centre of the plateau,' says Burnes, 'is Saryk-kul, out of which there should issue, according to all accounts, the Jaxartes, Oxus, and a branch of the Indus. This plateau, which affords excellent pasturage, extends round the lake for a distance of six days' journey in circumference; and it is said that from this elevation all the adjacent hills appear below the observer.'

"Arrowsmith's map shows also, in lat.  $38^{\circ} 40'$ , Lake Dzarik-kul, doubtless the Surik-kul of Burnes' narrative; it is represented as one of the sources of the Oxus (Vokhan River), and as a basin rather elongated from north to east, somewhat resembling the Sary-kul of Lieutenant Wood. But the latter lake is situated  $1^{\circ} 13'$  more southward of Dzarik-kul of Arrowsmith's first map.

"On the same map, to the north-east of Dzarik-kul, in lat.  $38^{\circ} 56'$ , there appears the much larger lake of Kara-kul, out of which flows, on the east (*vide* Klaproth's map), the River Tashbalyk, also called the Yaman-Daria, and which lower down receives first the names of the Kashgar-Daria, and then that of the Tarym. Lastly, still more northward of Kara-kul, Arrowsmith's map shows a third alpine lake—that of Rian-kul ( $39^{\circ} 18'$ ).

"All these considerations tend to show that a similar liability to that previously observed by me in my researches into the geography of the New World exists also here, namely, the liability not only to transfer the same points to the north and south, but also to confound proper names together. On Macartney's map Surik-kul is placed more northward than Kara-kul, while on Arrowsmith's it appears more southward. Zimmermann inserts both Dzarik-kul and Kara-kul lakes almost in the same parallel of  $39^{\circ}$  on the Pamir Plain, and shows one of the branches of the Oxus (the Fatsu) as emanating from Dzarik-kul in a direction from north to south. But the lake visited by Wood discharges another branch (Dura-Sary-kul) in a direction from east to west (this branch flows to the southward of the celebrated ruby mines). The very name of Sary-kul (Dzarik-kul) has become a prolific source of error. Besides a lake or lakes of this name, there are many inhabited places west and east of

the Bolor which bear the same appellation, though their situation differs considerably in point of latitude.

"Although the position of the Pamir in connexion with the astronomically fixed lake of Saryk-kul ( $37^{\circ} 27'$ ) becomes determinable, the plateau itself is not nevertheless uniformly inserted on all maps. Macartney's position for the Pamir is between  $38^{\circ} 10' - 39^{\circ} 5'$ ; Baldelli's  $30^{\circ} - 40^{\circ}$ ; Klaproth's  $39^{\circ} 36'$ ; Arrowsmith's (on his map to Burnes' work)  $34^{\circ} 40' - 39^{\circ} 55'$ ; Ritter's  $39^{\circ} 31'$ ; Arrowsmith's (map to Wood's work)  $37\frac{1}{2} - 38^{\circ}$ ; Zimmermann's  $39^{\circ} - 39^{\circ} 5'$ . When the '*Bombay Gazette*' gave the first accounts of Wood's journey to the sources of the Oxus, to Lake Sary-kul, and to the plateau 15,000 feet high, it was imagined that this dauntless explorer was much more to the southward of the region of the Pamir proper than he actually was. For some time I also shared this supposition. But the publication of Wood's valuable work soon dissipated my doubts respecting the identity of the Pamir with the neighbourhood of the Sary-kul. The traveller was surrounded by those Kirghizes who give themselves out as masters of the whole of the Pamir. When at the point of junction of the two branches of the Upper Oxus, at Issar ( $37^{\circ} 2'$ ), Wood being in uncertainty as to which route he should follow, heard that the northern branch was called the Pamir branch. The Pamir was described to him by the Kirghizes as a high alpine region, which might very properly include the lakes of Rian-kul and Kara-kul, in latitude  $39^{\circ}$ . These Kirghizes stated in a very positive manner 'that Lake Sary-kul was situated on the roof of the world, and that this roof was the Pamir.' The road along which Wood ascended to Sary-kul is the caravan-road to Yarkend. It is to be regretted that the traveller does not state which part of the Pamir is called the Little Pamir.

"The Oxus is formed, like many other large rivers, by the junction of several branches, so that we may set aside the doubt respecting the lake which, according to Pliny, forms its veritable source. But is the Sary-kul of Wood the Dragon's Lake of Son-Yun and Huen-tsan? The route of the first of these Buddhist travellers, who started from Tashbalyk ( $39^{\circ} 10'$ ), runs, according to the Chinese text, not from south to west, but due west, and does not apparently approach lat.  $37^{\circ} 27'$ . At the same time, however, the fable of the dragon is identical in the accounts of Son-Yun and Huen-tsan, and the latter it appears proceeded in a north-east direction, which might lead to Sary-kul. It is not so easy to see how, travelling south towards the Bolor, where there is much gold, the traveller could reach Tashbalyk. It would be necessary to presuppose the Ko-panto kingdom, which extends further eastward than the Bolor, as being situated far to the south."

These are the words of the great natural philosopher to whom the geography of Central Asia owes its foundation. It is not difficult to see what Humboldt still required, in order that his clear mind might present the same definite and lucid picture of the Bolor and sources of the Oxus as he drew of the Andes, or the general features of the orography of Asia. He had no evidence connecting in an unbroken chain the fragmentary statements of travellers. The Bolor and the Highland of the Pamir were considered as being unvisited by a single traveller along a route from north to south. The chaos of geographical accounts respecting this region was so great that Zimmermann, the celebrated geographer of Berlin, could, even when working under the guidance of Ritter himself, only produce a very con-

fused and unintelligible map. It was to be expected that the connecting-link would be discovered, that is, that some one would undertake to realise the scheme which had been contemplated by the Russian Government during the early part of this century. Very fortunately such a necessary source of information respecting the geography of High Asia has been discovered, irrespective of the long-neglected expeditionary project; nay, we possess two new sources of information which mutually corroborate and amplify each other, although they have nothing in common in regard to their compilation.

I here allude to the *‘Travels through Upper Asia from Kashgar, Tashbalyk, Bolor, Badakhshan, Vokhan, Kokan, Turkestan, to the Kirghiz Steppe, and back to Cashmere, through Samarcand and Yarkend;’* and to the Chinese itinerary translated by Klaproth in 1821, leading from Kashgar to Yarkend, Northern India, Dairim, Yabtuar, Badakhshan, Bolor, Vokhan, and Kokan, as far as Karatau Mountains. The enumeration alone of these places must, I should imagine, excite the irresistible curiosity of all who have made the geography of Asia their study. These fresh sources of information are truly of the highest importance. As regards the *‘Travels,’* it is to be inferred from the Preface, and from certain observations in the narrative, that the author was a German, an agent of the East India Company, despatched in the beginning of this, or at the latter part of the last century, to purchase horses for the British army. The original account forms a magnificent manuscript work in the German language, accompanied by forty sketch-maps of the country traversed. The text has also been translated into French in a separate manuscript, and the maps worked into one itinerary in admirable style. The Christian name of this traveller, Georg Ludwig von —, appears over the preface, but the surname has been erased. Klaproth’s itinerary is so far valuable as the physical details are extremely circumstantial; almost every mountain is laid down, and care taken to indicate whether it is wooded or snow-capped; while equal care is taken to show whether the inhabitants are nomads or a stationary people. Ruins, bridges, and villages are also intelligibly designated, so that although the same scale is not preserved throughout, its value, lucidity, and minuteness, are not thereby deteriorated. Without entering into details respecting these materials, the first of which is especially deserving of wide publicity, I shall proceed to give extracts from that portion of the *‘Travels’* which relates immediately to the Bolor and the surrounding region.

“The road from Kashgar to Tashburik leads through well-cultivated fields and highlands, which stretch as far as the Altyntag Mountains. At the period when Kashgar was governed by its own princes, gold to the value of more

than 180,000 ducats was yearly extracted from the mines of these mountains. But the Chinese Government have filled up all the old mines and workings, and even flooded those parts of the country where mines might be opened. Moreover, all the neighbouring heights are guarded by Kalmyk pickets. The working of these mines must be very easy, and according to some local particulars given me by the Armenian Guka, no shafts in all probability were ever sunk here, nor levels dreamed of. In the possession of my friend I saw a specimen of quartz as large as a man's fist, of a dark brown colour, and intersected with veins of gold. Guka valued this specimen at 40 ducats. Gold-yielding sand is also found in Gumri rivulet, which flows eastward from the above mountains to the River Kashgar. On the following day I joined a caravan which was halting at Tashburik in expectation of some loads of rhubarb, a great quantity of which is exported from hence into Persia.

"On the 21st of June we crossed the Yapuar River, which flows past the town, and spent the night in a good caravansari, near which the Taktabash rivulet, falling into the Yapuar from a rock 300 feet high, forms a fine cascade, and appears to be lost in spray as it rushes down between the numerous crags. The beauty of this scene was enhanced by the splendour of the sun, which formed a double rainbow in the misty vapour. Our second night-halt was at Ola rivulet, which also flows into the Yapuar, and which supplied us with some excellent trout.

"Farther westward the road led us uninterruptedly along the southern bank of the Yapuar, which descends in a continued series of cascades. This river issues out of the Lake Kara-kul and flows eastward through a valley bordered by high hills. This valley is very fertile, and the pastures of its meadows, on which the herds of the pastoral Burut-Bolsa tribe were browsing, is remarkably rich."

This is the same route that was followed by Son-Yun in proceeding to Dragon's Lake.

"As we ascended the Yapuar the country became wilder and the air colder. The high Chahar-Aller Mountains rose on the north, while on the north-west appeared the summit of the Tengri-Tiub, partly lost in the clouds. After the Himalayas this was the highest mountain that I had seen.\* At the distance of about one agatch from whence the Yapuar issues out of Kara-kul Lake, we crossed from the right bank to the left, and proceeded towards the lake, to the point at which the Katun rivulet falls into it.

"On the 24th of June we continued our journey along the northern shore of Kara-kul; but soon after midday a storm, accompanied by a drift of fine snow, compelled us to halt and pass the night at the foot of the Alalyk Mountains. On the following day the storm subsided. The water of the lake is of a dark colour, and during the continuance of the storm the waves breaking on the rocky shores produced a great noise. According to the statements of the Buruts who accompanied me, the lake contains plenty of fish. On an island in the centre of it there must be a warm spring emitting strong sulphurous fumes, as native sulphur is found close by in the form of crystals, which the Buruts collect and bring in great quantities to the market of Kashgar. There is also a kind of sulphurous mud which is used with success for mange in horses.

"About ten years ago a battle took place near Alalyk and Ulyatch moun-

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\* It is also here, on the meridian of Ush and Andijan and a little southward of these places, that the Kirghizes and Turkistanis, who visited Ferganeh, placed the highest points in Central Asia. They gave the name of the *Alai* to the whole of this elevated mass, under which designation the Bolor range is sometimes comprised.—*Note of M. Veniukof.*

tains between the Chinese and the Belors, which terminated in the overthrow and subjection of the latter. On the 26th of June we halted in the defile where the battle was fought; this defile is the real key to all the countries lying to the eastward, as all the roads leading from the west unite at a short distance beyond it. The natural strength of the pass is so great that a single redoubt with two batteries and a garrison of 500 or 600 men might hold a strong army at check, as the hills on the right and left are inaccessible to cavalry and artillery, and the narrow pathways would with difficulty be traversed by infantry.

"It is incomprehensible why the former inhabitants of this region when building the fortifications, of which the ruins are still visible to the south of the defile, did not fortify the pass itself, which might have been done with very little trouble. They built an excellent stone bridge over the Aksu, consisting of one arch of considerable span. We passed the night on a high spot, at about half an agatch to the south of this bridge. The rapid Pana torrent takes its rise here and flows through a deep and rocky defile towards the river Bolor. Some nomads of the Chingir-Geiba tribe were at that time camping at its mouth, and we encountered many of these wanderers along the course of the river to the very town of Bolor. The whole of this deep and horror-inspiring valley is filled with large ruins, showing that at one time it was inhabited by a settled people. It is said that the capital of this people was situated at Koolit Mountain, along both banks of the Mingis rivulet, where extensive ruins are to be seen to the present day.

"After crossing the Kuzluk River we entered a dense forest called Kasbatir, which extends south-westward for 12 agatches, reaching to the borders of Badakhshan. I found a numerous horde of nomads on the right bank of the Bolor, and I remained among them several days purchasing horses, 980 of which I despatched to Kashgar. To the leader of these horses I entrusted two copies of the account of my journey and an equal number of sets of geographical maps, completed by me up to that period, in order to insure their safety.

"Between the mountains Asbulash and Elirator there is a very large mine of native cinnabar, which the Belors carry to Badakhshan and Kashgar in its native state and in the form of mercury. The yield from this mine amounts to 40,000 oz. of silver. While among the Belor-Oma nomads I tasted a very strong rectified spirit called telik-araki, which is distilled from some black berries resembling cherries.

"On the 3rd of July I reached the town of Bolor, and was well received, not only by the Chinese general, Kulmatu, but also by the Armenian trader Kurlak, to whom I was recommended by Guka. So successful was I in gaining the favour of the Governor by my praises of his victory, that he was much pleased with me, and requested me to remain some time longer with them at Bolor, on account of the great horse fair at Badakhshan, which would not be held until the end of August.

"On the 23rd of August I was at last able to leave Bolor. At about half an agatch from the town we crossed a rapid river, and proceeded across the mountains through a rocky and dangerous defile, after clearing which we passed through some others, called collectively Blakh. Two rivulets which flow through these defiles form the small river Namzir, which falls into the River Duvan,\* through a narrow and deep gorge thickly clothed with trees. Near the Badakhshanian village of Palok a fine bridge leads across the Duvan River, but the Kaltan-Agatch Forest only comes to an end at Amin rivulet.

\* This River Duvan is in all probability the branch of the Oxus which takes its rise in Lake Sary-kul.—*Note of M. Venikoff.*

"On the 25th of August I safely reached Badakhshan. This town is situated on the southern bank of the River Sharud, and inhabited by Mahometans, who are governed by a separate sultan, amenable, however, to the supreme authority of the Chinese. Although the Chinese garrison of this place is very small, the native ruler is, for many reasons, firmly attached to the Chinese Government, the principal being the great profit derived by his subjects from the conveyance of merchandize between Persia and Kashgar, which latter place has been subject to China since the establishment of the Chinese at Badakhshan. The district of Badakhshan is watered by the Duvan and Sharud, and is extremely fertile. Besides the trade in horses, cattle, leather, and leather manufactures, a considerable traffic is carried on in precious stones; such as rubies, sapphires, hyacinths, and a particular description of lapis-lazuli, which cannot be obtained anywhere else of such excellent quality and in such abundance.

"The beautiful plains which extend between the mountains are so fertile, that they can truly be called the granaries of this region, and they even supply rice and barley to many of the neighbouring countries. All the necessities of life for the poor are here found in abundance. The situation of the country is one of great strength, and the region is only approachable through five narrow defiles. The north-eastern defile through which I passed was defended at the village of Tur by a fortress and by some redoubts in the Namzir Valley; similar works of defence are erected in the other valleys. Whoever is ruler of Bolor and Badakhshan is in a position not only to dictate to the Chinese at Kashgar and Yarkend, but also is master of the road that leads to India. The fine canals possessed by the inhabitants are another source of riches to the country. These animals are very strong, have extraordinary powers of endurance, and carry loads of every description.

"After recovering from the fever under which I had suffered from the end of August to the latter part of January, I left Badakhshan in company with many travellers and traders who were taking goods to Vokhan. We proceeded northwards at first, and then bent our course to the west. Our first halt was at the village of Panirlik, situated close to Bol Lake, and justly celebrated for the excellence of the cheese that bears its name. The inhabitants carry on a lucrative trade in this cheese, which resembles the Dutch in taste. On the following day we made a journey of 12 agatch to Pirmahmud, a fortified village on the right bank of the Duvan, which at this place is very broad and rapid, and over which we crossed on the following day in broad ferry-boats. As far as Sulta the country is both fertile and pleasant in aspect; beyond that point, however, the mountains extend again across the face of the country.

"The road beyond brought us to Ladhul Lake; we then ascended a narrow and rocky valley, at the head of which, between Kartul and Jilak mountains, there is a very strong guard-house, which marks the frontier between Badakhshan and Vokhan. After ascending a broad mountain-slope we passed a ruined military post of Vokhan, situated on a very rocky eminence between the turbulent Otichai and Kara-balyk rivulets. The latter receives its name from a small, though very delicious, fish caught in it. These two rivulets uniting together form the Birlagul mountain-torrent which rushes down in a narrow stream 400 paces below the guard-house, though a crevice 300 feet in length in the rock, which roofs in the torrent with its overhanging crags. Here also are to be seen the ruined fortifications and walls which at one period defended the entrance into the fertile Vokhan Valley. The four villages of Kishlak, Talkent, Imbirlar, and Testuta, occurring beyond this pass, are also fortified, but their inhabitants are very poor, and live on the produce of their herds and by the pursuit of agriculture. Their principal occupation, however, consists in collecting gold sand, along the Talsu and Endir rivulets. This

gold sand is found in abundance, and is gathered under the supervision of Altyn-Bashis and armed soldiers, who convey the gold to the ruler of Vokhan. The gold-seekers receive in compensation a small percentage on the gold found, which amounts yearly to the value of 42,000 to 48,000 ducats. Instead of being paid in gold, the labourers receive in satisfaction agricultural produce, and other necessaries of life. The sale of gold is prohibited under punishment of death. Owing to this regulation we were accompanied by a convoy of eighteen armed men from Kishlak village as far as Vokhan, so as to prevent us holding any intercourse with the natives. I reached Vokhan on the 18th of April. The town is situated on the left bank of the Birlagul,\* on a plain surrounded by a high wall, and containing as many as 7000 inhabitants, principally Mahometans. Malek-Shah-Bezirk, the ruler of the country, is under Chinese domination.

"There are several silver-mines on the opposite side of the Birlagul River and near Gumbot village, but they are not so rich as those at Urla, near Kur-takul Lake and at Nola, Valig, and Soshu mountains, the last of these mines yielding 820,000 ounces of silver, as Malek-Shah-Bezirk assured me himself. With the exception of these mines the country is poor and mountainous to Kashgar, so that the greater part of the wants of the natives are supplied by Badakhshan and Kokan. The mountains abound in bears, foxes, lynx, badgers, elk, wild goats, and other animals, yielding good skins and furs. On the 3rd of May I left Vokhan, crossing the Birlagul, and following its course and that of the streams falling into it.

"After ascending the long and narrow valley of the Olbi rivulet, and reaching its source, we traversed the high and level summit of the Tanglak-Yar Mountains, which is several parasangs in breadth, and covered with ice and snow. The Terekehai rivulet, which is formed by the thawing of the ice and snow, flows in a continuous cascade through a ravine towards the Aksu, on the left bank of which we made a halt. This is the same river over which we crossed on the 27th June last year. Its borders are inhabited by the wandering Burut-Alis, who possess many horses and are under Chinese rule. A very fine description of lapis-lazuli is found at Tash-tal rivulet, and is eagerly sought after by Kokanian traders. After leaving behind us the source of this stream, we emerged on the snowy plateau of the *Pamir*, which is always swept by a very cold wind and rendered, in this manner, insupportable as a permanent place of habitation. The several lakes existing here are covered with ice all the year round, the surface of which is so smooth that the snow is always blown off by the wind. On descending northwards from the Pamir plateau, the traveller sees before him the large lake of Rian-kul (Lian-kul), in which the water is so cold that no fish are able to exist. To the north of this lake rise the icy summits of Taluk, Alaktag, Kichu-Alak, and Altyutash; our road lay between the two latter as far as the lower course of the Golinglu rivulet, which forms the boundary of Kokan.

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\* From Klaproth's translation of the march-route which leads to Vokhan, it is to be seen that the Vokhan River, an outlet of Lake Dzarik, and a continuation of the Bolor River, flows from the north-east to the town of Vokhan. In our traveller's narrative this river is not mentioned, and the Birlagul is continued north-westwards from Vokhan. Probably he did not see the junction of the two rivers under the walls of the town, and subsequently crossed over the united stream of both. It would be curious to know what Wood comprehends under the name of Vokhan, —whether it is the valley of the upper course of the Oxus, as Macartney represents it in his map, or merely the south-eastern extremity of the Vokhan territory? The latter supposition is the least probable, from the small geographical area of Vokhan. Most likely it is a proper name, like many others in Central Asia Kara-kul, Aksu, &c., which are applied at once to several localities.—*Note of M. Veniukof.*



"From this rivulet \* we ascended northwards, and again crossed over the very cold Mangulat Plain. Beyond it we penetrated into the Kara-Agatch Mountains, which are thickly wooded, and afterwards descended to Koshlush rivulet at Ait-kent village. This was the first inhabited spot we had reached after leaving Vokhan. Here I had a severe attack of dysentery, and was confined to bed for four days. The principal pursuit of the natives of Ait-kent village consists in working the iron-ore which they obtain from Temir-Ura Mountain; they also manufacture steel of very good quality, and are very skilful gunsmiths. Near Gashukent we entered the luxuriant valley of Kokan covered with villages and fertile fields. Unfortunately I could not derive much enjoyment from this magnificent country, as I had hardly strength enough left in me to accomplish the journey to Kokan, which town I reached in a very sickly condition. My illness lasted for a whole year, so that during the whole of this period I was not able to keep up my diary. The short notes which I did make were lost on two separate occasions, when I met with accidents; my maps were alone saved by a miracle."

To this highly interesting information nothing can be added with respect to the Pamir, to Rian-kul, Kara-kul, Dragon's Lake, Dzarik-kul, the Bolor River, and Sary-kul Lake, visited by Wood. The map appended to this paper will illustrate the matter more clearly than any reflexions, a few of which, however, I have added at the end of the paper. I am much afraid of being rebuked for the boldness with which I have dotted the determined course of some rivers, and distributed the principal points on the map. Mention has already been made of Humboldt's recommendation as to the necessity of placing reliance on the determination of the Jesuits of the period of Tsian-Lun. I have adhered to these in inserting Kashgar, Tashburik, Yangisar, Yarkend, Karshu, Andijan, Kokan and Ush on my map. The same authorities have served me in assigning the position of Sary-kul ( $37^{\circ} 48'$  lat., and  $91^{\circ} 41'$  long. E. of Ferro), which our traveller calls Lake Valbuni, but of the identity of which there can be no doubt, judging from its configuration and position. As regards Vokhan and Bolor, included by D'Arocha in his list of astronomical points, I must be allowed to express some doubts as to the accuracy of their determination which, though they may be well known at Pekin, may not have reached us in an authentic form. Both these towns lie apparently north of parallels  $38^{\circ}$  and  $37'$ , under which they are given in the "List" of Messrs. Tolstor and Khanikof. At all events this is as they come out according to our traveller's itinerary which may be easily laid down on the map along the whole journey from Kashgar to Badakhshan and thence to Kokan. The agreement of this new source with Kiepert's map of the *Turan* in *Ritter's Erdkunde*, the best in existence, with the accounts of Burnes and Khanikof's map (the Khanat of Bokhara) is so striking, that I considered it quite safe to take for instance

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\* Vide Addenda, IV.

the Aksu as the commencement of the Zarafshan, and the Duvan for the Dura-Sarykul of Lieut. Wood. Two spots remain marked "*terra incognita*" on the map,—namely the great plain to the west of Vokhan, where Karatigen and Darvaz should be situated, and which extends as far as the region to the eastward of the Bolor and to the north-westward from *Lake Victoria*.

I again say that it would be the height of temerity to assert that the problem is solved, and that the geography of the Bolor has been cleared up. A great many changes will have to be made on the map of the Pamir before we can arrive at a correct knowledge of this upland plain, but even a more intimate acquaintance with it would hardly change the principal data embodied in the accompanying map. It is not probable that anybody will doubt the existence of lakes Kara-kul, Rian-kul, Dzarik-kul and Sarykul (*Victoria Lake*), of the river Bolor as the northern source of the Oxus, and of the Sharud as the Badakhshan branch. It must also be presumed that nobody will venture to assert that the Pamir of Wood is only a southern extremity of that plateau, the extent of which is estimated by Son-yun at 1000 li. Nor will anybody entertain doubts as to the accuracy of Klaproth's map founded on the surveys of Tsian-Lun, in which the positions of Kara kul and Rian-kul appear as on our maps, and lastly it is hardly possible that anybody would not separate the Kazy-yurt and Boroldai ranges from the Bolor system and class them under the ramifications of the Tian-Shan. The geographer who loves truth should be cautious in his conclusions, but such caution should not exclude confidence in the results which are deducible from undoubted sources.

I shall now venture to make a few observations respecting the social condition of the mountainous region of the Upper Oxus, so celebrated since the days of Alexander, and with regard to the Oxus generally. Strictly speaking, such remarks should not find place in a paper of a purely topographical nature, but they involuntarily suggest themselves here to the mind.

To the Imperial Geographical Society, who hold the memory of Mr. P. Golubkof\* in great esteem, my remarks may appear bold and not very patriotic, but I shall nevertheless offer them.

If we take Wood's *Victoria Lake* as the commencement of the Oxus, the whole length of the river to the Sea of Aral will then extend over 1120 geographical miles. Among European rivers it approaches in dimensions nearest the Dnieper. But the basins

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\* Mr. Golubkof was the organiser of a Russian Trading Company with Central Asia; he was also a zealous promoter of the interests of Russian trade in Central Asia generally, and devoted much time and money to that object. The Company, after languishing for a short time, ceased to exist on the death of its originator.—*Note of M. Veniukof.*

of the Dnieper and the Oxus differ materially in size, natural conditions and historical signification. We must first observe that the Dnieper waters plains along the whole extent of its course, which are subjected to great atmospherical moisture, and therefore rich in vegetation. No mountains occur throughout its flat watershed, with the exception of some inconsiderable heights near the rapids. The Oxus, on the contrary, flows either through sultry, dry and consequently barren steppes, or through a mountainous region where the beds of its branches are strewn with rocks, and the valleys bordered by precipitous and rugged heights. Of its three\* principal affluents, the Sharud of Badakhshan alone waters localities celebrated for the richness of their flora. Burnes says that both natives and strangers speak in raptures of this country—of its rivulets, picturesque valleys, fruits, flowers and nightingales. But neither the valleys of the Bolor nor the banks of the upper course of the Duvan, visited by Wood, present any advantages for a sedentary life. On the contrary, these valleys, which are deep and narrow indentations in the surface of a high table-land, have the stern characteristics of alpine localities. Lake Sary-kul, notwithstanding that it is situated in the 37th parallel, continues to be covered with ice in the month of February. The glens of the Bolor Mountains are inhabited by a half wild race of people, who, being separated from each other by the mountainous character of the country, do not fuse into large well-organised communities, but retain the habits of wandering marauders and exist on the plunder of caravans. Without stopping to examine at what point of this upland region the little-known Belors are superseded by Pamir Kirghizes or Buruts, it may be observed that the imagination of the eastern people has not without some foundation peopled the Bolor range with troglodytes or barbarian races. Huen-tsan in the seventh century of the Christian era states that the inhabitants of the upper sources of the Oxus are devoid of all courtesy and justice, prone to violence and hideous in appearance. It is noteworthy that this Buddhist missionary describes them as having blue eyes—an uncommon feature in Turkish and other races on the east and west. Whether the Belors and the Kaffir Siahpushis of Burnes are one and the same tribe, or distinct offshoots of the Indo-Persian race must remain a matter of conjecture, as no positive conclusion can be arrived at. It is, however, plain that the extensive region from the Hindu-Kush to Rian-kul, and from Kunduz to Hissar, to the eastward of the Bolor range, is inhabited by tribes which, from the physical nature of their country, their development and state of civilization, are not destined to play an important and independent part in

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\* Vide Addenda, V.

history. Although some of these tribes did at one time offer a stout resistance to the conquests of Alexander, and formed part of the kingdom of Bactria, founded by the Macedonians, still in the present day it is difficult to conceive the possibility of a well-organised and homogeneous state being founded in this region. When we moreover remember that this basin of the sources of the Oxus is closed in on the north, east and south by mountains from 15,000 to 18,000 feet high, and across which the roads for pack-animals are few and difficult to traverse, we must arrive at the conclusion that all idea of converting this region into a rich *entrepôt* for a trade with India must be abandoned.

The same mournful conviction impresses itself on our minds when we glance at the course of the Oxus beyond the southern confines of Badakhshan, Vokhan, Karatigen and beyond Termez and Balkh. Commencing from the first of these two latter points as far as Pitniak, the first town of the Oasis of Kharezm, and a distance of about 540 miles, the settled population, as it is well known, keeps aloof from the sultry valley of the Jihoon. The banks of the river along the whole of this extent are occupied by small towns and villages which occur near ferries or at the intersections of caravan-routes. Hence, although the river, as at Chardjui, has a breadth of 235 fathoms, and a depth of 4 fathoms, there is but little chance of its ever becoming a great highway to India from Europe. When we also consider that the shores of the Sea of Aral are so barren as to have defied all the attempts hitherto made at founding even a small settlement on them, that the Aral itself is separated from Russia by intervening steppes 530 miles broad, and lastly seeing the utter impossibility of modifying the characteristics of the nomad marauders, we shall be justified in asserting that even in the remote future the Oxus can only be a secondary channel for the advance of industry and civilisation. It is difficult to surmise whether civilisation will penetrate to its sources—the prolific birthplace of metals and precious stones—from the north-west, from the Aral or from the south over the Hindu-Kush. I, myself, am rather inclined to think, and I hope my opinion will not mortify the patriotism of my fellow members, that its advent must be expected from the latter quarter.

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#### NOTES AND ADDENDA.

I SHALL here direct attention to some of those points of the geography of the Bolor which still remain doubtful, or respecting which we possess contradictory accounts.

I. It may firstly be asked, Where is the southern extremity of the Bolor? Without going so far as to place the limit of this range at Tutukan-Mutkhani

peak, which evidently belongs to the system of the Hindu-Kush, the Push-tikhar Mountain, spoken of by Humboldt, may be accepted as this extremity; the position, however, of this elevation is not accurately known to us. On Macartney's map the Pandj, or middle branch of the Oxus, is shown flowing out of it; but is the mountain really situated to the north-west of Karshu, as it should be if the Vokhan Valley visited by Wood and the southern extremity of Sarykul lie in latitude  $37^{\circ} 27'$ , and longitude  $91^{\circ} 33'$  E. of Ferro; that is, not more than about 20 miles from the first point. With respect to this nothing positive can be said. That the town of Karshu is situated close to high mountains is an undoubted fact; but apparently the highest of these, forming the knot or connecting link of the Bolor system with the Kuen-Lun, Hindu-Kush, and even Himalayas, rises not to the north of Karshu, but south of it, in latitude  $36^{\circ} 40'$ , and longitude  $91^{\circ} 92'$  E. of Ferro. The excellent map of Strachey at least leads one to suppose this, and some statements of our German traveller tend to confirm the same idea. Thus in latitude about  $36^{\circ}$  on the map referred to we find, stretching from west to east, the snow-clad Lopsha range, at the northern slopes of which Lake Tumbel and others are marked; high snowy mountains are then shown at the upper sources of the Ardnig, which, with every probability of truth, may be taken for the beginning of the river Kaman, an affluent of the Cabul. These latter mountains are situated due south of Karshu, at a distance of only about 27 miles from that town. It is particularly satisfactory to find that 'The Travels' supply us with the means for filling up on the map the space to the north-west of the Indus and to the westward of Gilgit. These parts have been generally, and correctly too, marked "*terra incognita*," "unexplored," &c., on European maps. A review of the materials afforded by 'The Travels' could only be properly made in a separate geographical memoir, which would not embrace the Pamir. Suffice it here to say that apparently no such marked disconnection really exists between the systems of the Bolor, Kuen-Lun, Himalaya, and Hindu-Kush, as stated by Humboldt. At all events the three first appear to have been formed by one upheaval, the axis of which runs in a direction from north-west to south-east, while the southernmost masses extend in parallel rows. In this manner the Kuen-Lun would not appear to be a prolongation of the Hindu-Kush; and this view is confirmed by Thomson, Strachey, and even Shakespeare, who do not consider the Kuen-Lun to be an independent chain, distinct from the high table-lands of Ladakh and Baltistan, but only as its northern ridge or belt, in the same way that the Himalayas form its southern limit. Do not the two main chains marked on the accompanying map parallel to the rivers Bolor and Kara-Golu, form in a similar manner the confines of the high plateau to which the designation of the Pamir is generally applied? Moreover, if the table-land of North-western Thibet rises, as stated by Thomson, at the sources of the Shack, to 17,500 feet, will the Pamir in such case have the exclusive right to be called the "roof of the world"? These are two questions of considerable interest.

II. The second doubtful point in the geography of the Bolor arises on a comparison of Klaproth's map and the statements of our traveller with the words of Huen-tsan, relative to two streams flowing out of Dragon's Lake to the east and west respectively. It may, I think, be taken for granted, as being beyond all doubt, that Lake Kara-kul has only one outlet—the Yaman-Yar or Yapur. What is that river, then, which is alleged to flow westward from Dragon's Lake? Even supposing that Huen-tsan speaks of Dzarik-kul, the matter still remains clouded in doubt. Bian-kul cannot be taken for Dragon's Lake, inasmuch as no pass or mountain-cleft is known to exist between it and Kara-kul, and besides, no outlets are shown from it either on Klaproth's march-route or on the map of our traveller.

III. With reference to the Pamir, the rather delicate doubt arises as to whether the Bami-dunia of Lieutenant Wood is, strictly speaking, identical

with the Pamir, as Humboldt supposed it to be. By only extending this appellation to the whole centre portion of the Bolor highland, as is done by Son-Yun, can the contradiction be reconciled? The form of this high upland is so natural to the alpine region between Fergana and India, that other valleys, even more than 15,000 feet above the level of the sea, may be found to exist. The following is an enumeration of five such valleys:—Mangulak, Pamir, the plateau between Aksu and Vokhan, the parts adjoining Sary-kul and the highlands near Kulsha lakes, probably near Sary-kul.

IV. Turning northwards from the sources of the Oxus, I shall now allude to another problematical feature of the Bolor uplands. From the Terek-tau mountain-knot, where the southern chain of the Tian-shan and the eastern branch of the Bolor are intercepted, the maps of Klaproth and Zimmermann show the head of the small Asferah-chai stream as flowing westwards. Klaproth extends it interrogatively to the bed of the Syr-Daria, in the direction of Kokan. Is this Asferah-chai identical with the Galinglik rivulet of our traveller, or does the latter form one of the sources of the Zarafshan, which apparently must be prolonged eastwards from the meridian of 88°, where the border-line of Khamkof's map comes in? If the Asferah-chai does really rise in the snows of the Terek-tau or Kashgar-Davan, then it is a considerable river, with a course extending over 200 miles, and must be considered as one of the largest affluents of the Jaxartes on the left.

V. The last remark I propose to make is one which affects the hydrography of the Oxus in an important degree. The three chief branches of this river—the Bolor, Duvan, and Shanud—may be recognised as uniting in one stream, but is the Aksu, which flows more northwards than any of the others, the real source of the Zarafshan, or does this river, likewise bending southwards, also enter the system of the Oxus, giving the latter its own name (Oxus—Aksu :) which has been preserved by ancient writers? In the absence of accurate data, this question may, with equal probability of truth, be solved either in the way I have done it on the accompanying map, or by marking the course of the Aksu southwards from the western part of the Pamir.

M. VENIUKOF.

## XX.—*The Belors and their Country*. By M. VENIUKOF.

Translated, for the Royal Geographical Society, from the 'Journal of the Imperial Geographical Society of St. Petersburg, 1862,' by J. MICHELL, Esq.

IF on the map we connect Cabul, Badakhshan, Yarkend and Cashmere by straight lines we shall obtain a square surface, the physical features and peculiarities of the inhabitants of which constitute it in all probability the most inaccessible and obscure part of Asia. Burnes and all the other travellers who passed along the valley of the Cabul River visited the southern confines of this region, while those on the north were skirted by Huen-Tsan, Marco-Polo, Benedict Goetz and Wood, and those on the east by Cunningham, Thomson, Strachey and the brothers Schlagintweit. With respect to its interior, however, no accurate information has been hitherto furnished, and it is only owing to a fortunate discovery made in the archives of the Military Topo-

graphical Dépôt at St. Petersburg that we are now able partially to dispel the chaos which has hitherto reigned, in our knowledge of the geography of this remote corner of the globe. On the best European maps the course of the Indus to the north-west of Cashmere is traced at random. The explorations of Strachey and Cunningham did not extend to any great distance westward of the great bend formed by this river at the northernmost point of its course. Northwards from Attock, the English surveys, as far as we know, have not extended beyond 68 geographical miles above this town. In this manner a portion of the course of this river, namely a distance of nearly 80 geographical miles, remains completely unexplored, and at the same time all the countries to the north-west remain involved in geographical obscurity.

The first accounts respecting this unknown region were derived from Elphinstone's description of his journey to Cabul, and the information there presented directed the attention of geographers to this interesting *terra incognita*. Subsequently, when Europeans became acquainted, through the translation of Stanislaus Julien, with the Chinese account of the travels of Huen-Tsan, further light was shed on the enigmatical "*blue-eyed*" race of the southern portion of the Bolor Mountains. The Buddhist traveller describes the mountaineers in very unfavourable terms, and says that these barbarians are strangers to hospitality and justice, that they are given to violence and plunder, hideous in appearance, and readily distinguishable from their neighbours by their green eyes. Burnes, when passing in 1832 through the Cabul valley, directed special attention to these blue-eyed barbarians, respecting whom he was able to collect information partly from the Afghans and partly from immediate personal observation. According to his account\* the country to the south-east of Badakhshan between this place and Peshawar, is inhabited by the interesting Sialpush-Kaffir race, or black-clad infidels, as they are called by their Mahomedan neighbours on account of their being dressed in black sheep-skins. These people exclusively inhabit the mountains, and are oppressed and attacked by all their neighbours, who kidnap and enslave them at every opportunity. However, a few years prior to the visit of Burnes, the ruler of Kunduz had made an inroad into the Kaffir territory, and lost on that occasion half his troops. The English traveller had opportunities of speaking with men who

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\* Vide Burnes' '*Travels to Bokhara*,' vol. iii., part I., chap. iii. Burnes appends a small vocabulary of the dialect spoken at Chitral, and remarks that the language spoken at Gilgit is already different. The route of George Ludwig von — lay between these places, and as it will appear, the sub-division of the population into several tribes, speaking distinct dialects, did not escape his observation. It is evident that the same phenomenon is reproduced here, in the ramifications of the Bolor and Hindu-Kush ranges, which prevails in the Caucasus, where the number of spoken dialects is very great.

had dealings with these people; and, when staying at Cabul, he saw a Kaffir boy, about ten years old, who had been abducted from his country two years previously. His features, his hair, and the colour of his skin were not Asiatic, and his eyes were light blue. The boy was able to answer many questions respecting his country, and gave specimens of his native language, which resembled some of the Indian dialects. The Kaffirs, Burnes says, are a very barbarous people who feed on bears and monkeys, are armed with bows and arrows, and scalp their dead enemies in warfare. Their country is very mountainous, and consequently difficult of access. The use of strong drinks is general among them; gold, too, is found in their mountains, and with it they make various useful and ornamental articles. The colour of the skin of the Kaffirs and their outward appearance generally have given rise to the supposition of their being descendants of the Greeks. This hypothesis is dwelt on by Baber and Abul-Fazal, who, however, have in this instance confounded the claims of the rulers along the Oxus to Macedonian descent with those of the Kaffirs, who really possess traditions of such extraction. The Kaffirs are a wild race, and neither their forms of religion nor their customs distinguish them from other races low in the scale of civilisation. The Kaffir women perform all the manual labour, and even till the ground. Burnes was also informed that they were usually harnessed in the plough with the oxen.

Somewhat different, though in many respects identical, are the accounts given by the Chinese geography respecting the Belors. According to this authority they inhabit the country to the westward of Yarkend. Their houses are built of clay, and they live together in villages; their language does not possess any written signs, and they do not understand Turkistani; their dress resembles that of the Andidjanis. They have sunken eyes, prominent noses, and bushy beards. The females are not kept in seclusion; four or five brothers possess one wife in common, and exercise their marital rights alternately, one hanging up his boots at night on the door outside in token of being in possession. The paternity of the children that are born is recognised in turn. There are no fraternal ties, and seniority in age governs the rules of their society. The country consists chiefly of sandy plains and salt deserts, and there is but little land adapted for agricultural purposes. The people are generally poor; they sow wheat and barley, though in small quantities. They cultivate mulberry-trees, the berries of which they dry in the sun and store up for food. Goat's milk is the principal article of diet with many, and a spirit is made by them from fermented mare's milk, which is a favourite beverage. The ruler is styled "Bi," and tribute is paid him in human kind. Those who have five or six children deliver up three,



and so on in proportion. The children thus surrendered in tribute are sold to the Kaisaks, to the Andijanis, and in the various towns of eastern Turkistan. The prices they fetch, according to Chinese authority, vary from 50 to 90 lams of silver (15*l.* to 27*l.*). The Belors are naturally a timid race, and the Buruts kidnap their men with impunity.

These accounts constitute the whole of the knowledge which we have hitherto possessed respecting the people whom we shall henceforward call Belors. Their evil reputation has been spread, not only among their Mussulman neighbours, who entertain great animosity against all unbelievers in general, but among Europeans as well, who have been afraid of venturing among the wild robbers so terrible for their scalping propensities. On the east, the Chinese judge them more leniently, and we shall immediately see that they are not so wild and ferocious as they were said to be. We will here observe that the region which we shall proceed to consider forms on the east the extreme limit of the countries inhabited by the Aryan family, who were the introducers of civilisation into India; we must also remark that in all probability the ancestors of the Belors were those warlike tribes against whom Alexander the Great\* had to contend, and that their distinct peculiarity of type, namely their blue eyes, would, on the one hand, tend to encourage the supposition of their affinity to the Germano-Slavonian races of Europe, and on the other, to favour the hypothesis of their being a remnant of the Central-Asiatic Ussuns who disappear from Chinese history in the fourth century of our era, and who partly fled to the upper sources of the Amu-Daria, having also previously been known to have existed in the country bordering lake Issyk-kul and to the north of Thibet.

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\* We here recall the principal features of the campaign of Alexander in Kaffiristan of the present day:—Crossing the Hindu-Kush by way of the Bamian Pass, the Macedonian conqueror marched along the left side of the Cabul River. Hephæstion and Perdicas were sent in advance to the Indus for the purpose of constructing a bridge, while Alexander followed in the rear subduing the adjacent Aspian, Therian, and Arasan tribes. These barbarians fought bravely, and skilfully choosing their positions, on one occasion making such a determined resistance, that after their surrender Alexander proposed to them that they should join the ranks of his army. This offer they refused, on account of their unwillingness to fight against their own countrymen; and the result was, that they were all put to the sword. In one of the battles with them, 40,000 prisoners were taken, and 230,000 head of cattle captured, of such an excellent breed that Alexander ordered some of the finest cows to be despatched to Macedonia. The last great engagement that took place was on the Aornos Hill, near the Indus, and considerably north of Attock. Advancing then to Bezirarda, Alexander constructed vessels with the timber growing on the banks of the river, and descended to the point at which Hephæstion and Perdicas were building a bridge. He founded the town of Arigei (probably on the Kamoh River), in the Cabul Valley, and populated it with his disabled and worn-out warriors. A separate satrapy was also established for the government of the local barbarians. *Vide* Arrian, Book IV., chaps. viii. ix. x.

Here are the words of our traveller Georg Ludwig von — respecting the country inhabited by this race, and regarding the population itself. We quote them verbatim :—

“When we approached the Sind (from Sirinagur to the south-east) we saw rising in front of us five high snowy mountain summits, these were Salchar, Olatam, Imbra-Embra (the Seat of God), Ardud, and Damarit; all these were tinged with purple by the rays of the sun. To the left of them, and high above the whole country, rose the Bastam-Bolo Mountain, whose summit to the middle of the snow-line was encircled in white clouds, all the other peaks standing out visibly in all their splendour. Before us extended the broad valleys of the Sind and Luimuka, whose meadows spread away like bright green carpets. On the high and sloping southern bank of the Sind River could be de-cried the villages of Parabira, Sailumba, Tarilumba, and Bari-lumba. The lower hills being clad with silver-firs, cedars, and other fine trees, gave the valleys a charming and picturesque appearance. The blue stream of the Sind, which is here 75 fathoms broad, flows on from east to west interrupted occasionally in its course by rocks. The ferry-boats by which the river is crossed are two fathoms in length and of equal breadth; three or four inflated goats'-skins are fixed on each side, and a large branch of a tree answers the purpose of a rudder. We crossed the river diagonally, at an angle of only 40° with the bend of the river; a few parsangs higher up the rapidity of the stream is considerably greater. When the river is swollen, which is frequently the case, the ferry-boats reach the opposite bank at a considerable distance below the mouth of the Luimuka.\* I did not succeed in finding the bottom in the centre of the river with a line 18 fathoms long, and even within a few fathoms of the bank the depth exceeded seven fathoms. After crossing the Sind we were finally clear of Cashmere, Afghan jurisdiction, and all Mahometans. It was near an old tower on the right bank of the river that we first touched the soil of the Clashgur-Gobi, a free and pagan race, remarkable for their hospitality, and who are continually harassed by their Mahometan neighbours.

“Some of the older inhabitants of Gurbar village, situated close to Olatam Mountain, keep guard at the above-named tower from sunset to sunrise, after which they return to the village, all further vigilance being unnecessary, as no person would venture to cross the river during the night. One of the Indians I had brought with me from Cashmere understood the *Bili* language, which is spoken here, and with his assistance I was able to converse with the three Gurbar guards at the tower. Their dress consisted of black goats'-skins, beneath which they wore a short shirt and wide and long drawers of chequered woollen stuff and drawn close round the ankles. Their weapons were spears and large bows and arrows. Suspended on their right side was a long and broad sword, and a dagger stuck on the other side completed their equipment. Their head-dress consisted of a felt hat of irregular shape, narrow-brimmed, and turned up at the sides. A strong smell of leather, moreover, pervaded their presence. The first question they asked us was whether we were Mahometans, which, to their great delight, we answered negatively. After many mutual inquiries we wished to continue our journey along the banks of the Luimuka, but they strove to detain us, urging us to remain a little time with them, and during this parley one of them proceeded to Gurbar to summon the chief of the village. We were in the mean time invited by the two

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\* The great rapidity of the Indus is easily understood when we bear in mind that at this point it is narrowed to 400 fathoms, and flows over a great incline. From Iskardo to Attock the distance is hardly 240 geographical miles, while the fall is 6050 feet, or more than 25 feet per mile.

remaining villagers to enter the town, the accommodation inside of which consisted of a single room with benches round the walls. Here they offered us some dark-coloured wine, which they drew with a silver cup out of large jars, and which we found to be very good. In a short time the messengers returned with two elders of the village, one of whom was distinguished by his superior costume and wore his sword on a silver chain. This personage repeated the inquiry as to whether we were Mussulmen, and assured us that we should be allowed to proceed on our journey on affording them evident proofs of our not belonging to Islam. After persistently refusing to satisfy their demands for a long time, we were at last obliged to yield compliance. The head man carefully inspected the whole of our party with the air of a connoisseur, and I may say was more critical than delicate in his scrutiny. Becoming at last convinced of the proof of our statement, he expressed the liveliest pleasure, and at a given signal all the five pagans began jumping about in a strange fashion, and exclaiming 'Imbra-Bolli, Gish-Bolli.' They continued this exercise for a quarter of an hour, filling their silver cups at the same time with wine, drinking it, and making us share their libations. In order to get rid of them and to be able to continue our journey along the Luimuka Valley, I gave them two yards of red cloth and five rupees, in return for which one of them volunteered to guide us to Mestopan—a village situated at the head of the valley. Having lost much time in our negotiations, we were at last obliged to remain at the old tower for the night. On the following morning, the 13th of May, we resumed our journey, and after proceeding a few parsangs we passed some ruins which lay on both sides of the road. Advancing higher up the Luimuka we perceived a stone pillar with an inscription, the characters of which were much defaced, and had nothing in common with Indian letters; this pillar occurred half-way up the valley, on the right side of the road; the rows of characters on it ran from top to bottom, and I concluded that they were Chinese, but as I have no particular knowledge of this language I may have been mistaken. After proceeding three parsangs beyond the pillar we reached the village of Mestopan, where the elders also came out to meet us. When our guide assured them that we had already undergone examination and proved ourselves not to be Mussulmen they appeared pacified, and received us very hospitably in their village. This is the last village of the Chashgur-Gobi, and clustering close to the side of the mountain resembles a swallow's nest. The flat stone roof of one habitation forms the court-yard of another above, in which manner all the villages of the Gobi tribe are built. The climate in the lower part of the valley was mild and pleasant, but above I found it inclement and cold, owing to the proximity of lofty snow-capped mountains. The pastures, however, were very rich, and large flocks of sheep and goats were to be seen grazing on them. The natives here weave a narrow dark-brown cloth, called 'daneh,' out of fine goat's wool; they also dress and prepare sheep and goats' skins very skilfully, something in the manner of morocco leather. The smell of their leather is stronger than the Russian 'yufta,' hence all the natives who employ it in their dress have a strong leathery smell about them, which may be pleasant to those who are fond of it, but to me it was very disagreeable.

"Several pillars with large human faces cut on them, representing the features of the dead, stand on a small knoll beyond the village; these figures \* are covered with tatters of cloth, and offerings of provisions are placed round them. This holy place is called *Immer-Umma*. Our arrival at the village

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\* The stone figures at Mestopan remind one of the celebrated idols of Bamian the erection of which is attributed to the Kaffirs, in all probability an indigenous tribe of the Indian Caucasus. The Bamian figures are known at Mahabarat.—*Note of Veniukof.*

was celebrated by fresh votive offerings to the idols of death, and consisted of a black rabbit and a large snipe. At the conclusion of the ceremony the skin of the rabbit was divided into as many parts as there were followers in my suite, each receiving a piece as a souvenir and as a proof of their hospitality.

"At Mestopan I was obliged to remain three days, as during the night that followed our arrival there was such a heavy fall of snow that the road in the Dimirt and Arlud mountains was completely closed. The men whom I sent to examine the route returned with the intelligence that we could advance. Starting, however, on the 17th May, we were only able to reach Ardud—a distance of only 6 parasangs—after a fatiguing march from six in the morning to eight in the evening. This delay was chiefly caused by our Hindu guide, Chandromali, who, owing to the severe treatment he had received at the hands of the Afghans, was rendered quite helpless, and was obliged to be carried along in a sheet.

"Ardud is the first village of the Serdi-Gobis, who occupy the valley of the Tomitandura rivulet, in common with the nomad Tsittur-Gobis, who live in felt tents. The Tomitandura rivulet, whose course we followed, soon flowed off to the south west, but the valley continuing to open out to the north-west, we proceeded along it as far as Marilpan River, *i.e.* the *Golden*. This name excited my curiosity, and I ascertained from the inhabitants of Sosna village, which stands close by, that grains of the precious metal, sometimes of the size of a pea, though generally smaller, are found in abundance in the bed of the river, under the gravel and alluvial deposit. These particles of gold are usually obtained in the summer and early in the autumn, when the water in the river is at a low level. The inhabitants are almost entirely ignorant of the art of manufacturing gold, and all the rings and earrings that I saw were very clumsily made. They generally barter their gold for goods, such as silk and woollen stuffs and various small articles which are brought from Kashgar and Yarkend. I obtained several ounces of gold in exchange for cloth and opium, of which latter article they are very fond. A druse [?] was found in a cavern near the bank of the Marilpan, by one of my Hindoos, when he was out shooting: the crystals were very clear, but so soft that I supposed them at first to be calcareous spar, many samples of which I had opportunities of seeing in the Hartz mines. This region appeared on the whole to be very rich in minerals. One of the Sosna villagers showed me some hard transparent stones, which he called 'Gashi,' and which are found among the pebbles of the river. These stones are much prized by the Yarkend merchants; and they appeared to me to be similar to those known at Badakhshan and Samarkand by the name of 'Yash' [jasper], in which a considerable traffic is carried on at those places. They are either of a milky or violet colour, and the stones of the first being much valued, are sold at four and five times the price of those of the latter.

"To the north of Marilpan rises the snow-clad and conical-shaped mountain of Pugeli, the summit of which terminates in four rugged peaks. This mountain, as well as those surrounding it, are bounded by the rapid Kirzeleh torrent which flows into the Marilpan. We proceeded along the rising valley of this stream, which terminates at the Polsha Hill, on the summit of which stands the last village of the Serdi-Gobi tribe. Leaving the Kirzeleh at the bottom of Polsha Hill,\* we beheld stretched before us the extensive snow-field called Pambut.\* It is nearly 5 parasangs (17 miles) in breadth, but I cannot deter-

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\* Pambut. This is another of those interesting uplands which are so numerous in the Bolor and Himalaya mountains. When we carefully consider the statements of the brothers Schlagintweit, of Thompson and Strachey, we cannot but conclude that the height of the Pambut plateau is not less than 16,000 feet above the level of the sea.—*Note of Veniukof.*

mine its length, as it extends even beyond Milinate, a high and icy mountain. On the north this plain is bordered by the rugged Lopsha Mountain, and in the centre of it there are several frozen lakes, whose surface is as smooth as polished glass. The snows on this plain are perennial, never disappearing in the hottest summer, and were so friable when we crossed over that we were 11 consecutive hours getting through them. My Hindoos were greatly surprised at this phenomenon, which was entirely a novel one to them; and it was no easy matter for me to persuade them to continue the journey, because they were under the apprehension that the whole country northwards were the same aspect. Towards nightfall we reached the base of Lopsha Mountain, and after a good night's rest, and a refreshing repast of tea and rice, we recovered from the fatigue of this stage. On the following day our passage over the Lopsha ridge, which is about 2 parsangs in breadth, was attended with great difficulty and toil. The schist mountains were very rugged and barren to the very summit of Lopsha; on descending the northern declivity, however, the surface becomes covered with wood, which grows gradually denser lower down. The trees on the heights consist of conifers, and on the lowlands of Chinars, broad-leaved oaks and a peculiar species of birch, the bark of which is of an orange colour. When we emerged out of the wood, a magnificent plain spread out before us, on which three large lakes were visible; near these lakes stand the settlements of the Kambali tribe.

"Beyond doubt this tribe belongs to the Gobi race; their language, however, varies so considerably from the radical Bili tongue that my worthy Gadama (the Hindoo interpreter) found great difficulty in understanding it. We were received here with the same hospitality as among the Gobi, and the young girls of Lombi village were so amiable as to evince a desire to enter into intimate relations with us, which I have reason to suppose was not distasteful to many of my companions. I also was obliged to conform to the usages of the country, and abandoned myself, on the banks of Tunbel Lake, to the mysteries of love with a beauty, who, notwithstanding her inexperience, was the daughter of the chief of the village. It is very remarkable that passages of gallantry between the unmarried of both sexes are held in great esteem among this people, and are even boasted of after marriage. This does not, however, in the least affect the mutual fidelity of a married couple.

"The plain around the lake is very fertile, well cultivated, and affords excellent pasture to good horses of indigenous breed; these in point of beauty and powers of endurance do not only rival the Persian horses, but even excel them in the latter quality. The horses at Gembek and Nembekhi in particular are very fine: they are sold at high prices at Cabul and Candahar, and sent in large numbers to the markets of Yarkend and Kashgar, where they are known under the name of '*Namghanat*,' and from whence they even reach Peking. It is noteworthy that the Kambali tribe do not know how to ride, so that the purchaser of a horse is obliged to break it in himself. This is attributable to a stupid superstition which is prevalent against the use of metal bits, in consequence of which halters are alone used. The horses, nevertheless, are so docile that they obey the whistle, clapping of the hands, and other signals of their masters.

"On the 21st May we crossed the Tambir River, which is formed by the confluence of three rivulets, the Gembek, Rori, and Nembekhi, and flows to the south-west. Below the village of Peresina the Tambir receives, on its right, the Sursa rivulet, flowing from the north, and which we proceeded to ascend. The valley of this river is formed by the Zelturbak Mountains, and it is one of the most delightful and fertile throughout the region, producing in particular much barley and very fine oats. The lower hills are covered with vines, which supply the inhabitants, who are here still of the Kambali tribe, with a very good white wine resembling the French St. Peray.

"It was the first time after leaving India that I found truffles on my journey; they were obtained in the Sursa Valley, where they are dug up by small black pigs. The natives do not eat the truffles, from an idea that they are produced by thunder striking the earth, hence their native name of thunder-nuts. This, however, did not prevent me from enjoying a young fowl with truffles for my dinner. The aspect of the Zeltubak Mountains is very striking: sinking gradually towards the south-east, they at last merge into a plain limited by rugged and precipitous sides, and covered with fine turf and excellent grasses; this level expanse is more than 2 parsangs in breadth, and stretches northwards as far as the Snowy Mountains, of which the dominating points are Chatkamiri, Lo, Ertimbu, and Dzazir.

"We had just left the village of Akhtulmbu when the whole country became enveloped in a grey mist which nearly stifled us. As it was impossible to advance we halted, after having traversed less than a parsang. The vapour was so dense that we could not see a yard before us. This fog is of frequent occurrence during the spring, and is called the *omimir*. The inhabitants consider it very unhealthy, and do not leave their houses while it lasts; but when forced to go out, the gall-nut, growing here in abundance, is used by them as an antidote against the injurious effects of this vapour. One of these nuts is placed with a little salt on the point of a knife and washed down with wine. We also found this an excellent remedy, although it made us feel a little sick at first. The mist lasted until 2 o'clock in the afternoon, when it suddenly disappeared. The grass and ground was covered with a malodorous dew and a white frost, which made the air very sharp. A violent wind blew from the snow-covered mountains extending on the right of the valley. Both men and beasts were so fatigued with the short stage performed this day that we were obliged to make an early halt for the night on the borders of a mineral spring. During the night three of our camels and a horse died. The mist produced an unfavourable impression on the Hindoos, who again began to grumble; my position, therefore, resembled somewhat that of Moses in the Wilderness. To humour my followers, I gave directions that a whole skin of arrak should be served out to them. I observed many tortoises in these parts, whose shells were very handsome, and whose flesh afforded me an excellent repast. We saw many large birds here, some of which resembled the bustard; the native name for them is *Busibo*, and they are remarkable for their majestic strut and formidable and curling spurs. Their flesh is very tough, but their liver is tender and tasty. Their smaller feathers would make excellent beds, if the natives only knew the use of such domestic luxuries.

"On the following day we proceeded along a hilly and harassing road which skirted the Robiri Mountain; we were only able to reach Ulshuma village, at the source of Lubi rivulet, by mid-day. This was the first settlement of the Belor-Ombo people, who inhabit the valley of the rapid Andinig torrent and its affluents. Their language and customs differ but little from those of the Gobis and Kambalis; their dress, however, is peculiar to them: instead of the woollen underclothing of the other tribes, the Belor-Ombos, both men and women, wear long trousers and shoes of wild goat's skin, which they prepare very skilfully and dye red and yellow. Their shoes are soled with thick bear's hide, and fastened to the feet with straps and strips of birch-bark. When hunting in the mountains they wear garters, or overalls, of black goat's hair.

"Leaving Lubi Valley we turned northwards and commenced ascending along the course of the Andinig torrent,\* which rushes down the wooded

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\* We have assumed the Ardnig to be the upper source of the Kameh River, on which Chitral is situated, and which discharges itself into the Cabul below Jel-  
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Wunbi Mountain in an uninterrupted cascade for a distance of several parsangs. In this valley there are the two lakes Logti and Vurkusk, floating on the surface of which we observed a considerable quantity of asphalt. We met with great difficulties at Balgi village, the elders of which demanded considerable presents in cloth and other articles for allowing us to proceed, and for guiding us up the valley of the Ardinig as far as its source. The negotiations extended over several days, so that we were only able to resume our journey on the 28th of May. The road along the left bank of the torrent, as far as Tserberi village, was the worst that I had as yet traversed in all my travels. The banks of the rapid Ardinig torrent were so encumbered with rocks and roots of trees that we were obliged to ascend along its bed. The men managed to get along, though with great difficulty, by jumping from rock to rock; but the horses and camels struggled painfully along, stumbling at every step. I here lost my best mule, which broke its front legs, in consequence of which I was obliged to order it to be killed. Beyond Akhtiling village we at last emerged out of the wood and entered on a very fine grassy plain. Here we passed the night, and reached on the following day the village of Verivist, situated near Mulgon rivulet, which flows from the north-east, and after a junction with the Efsiik, which runs from the north, forms the Ardinig. Both rivulets take their rise in a high snow-clad mountain, the several crests of which bear separate names, while the whole mountain possesses no distinguishing appellation.

"From Verivist we continued our journey through Manglambi village, and crossing the River Mulgon, ascended up to its source, from whence, proceeding through a rocky cleft, we reached the summit of the rugged declivity of the ridge of mountains between Kumbut and Vahimal glaciers. A violent storm arose at five o'clock in the afternoon, accompanied with a fall of fine snow, which compelled us to seek shelter under a ledge of rock, and to pass the night there. In spite of the violence of the storm, I could not help reciting several passages aloud from our great poet Klopstock. My Hindoos imagined that I was praying, and, following my supposed pious example, made loud supplications to their Deity, Gori-Rasha, who I imagine must have been a great warrior.

"The bad weather subsided on the following day, and, traversing another league, an extensive valley broke upon our view. This was a very grateful sight, and I sincerely praised God for it, as there is nothing so tedious as travelling through mountains where one is exposed to perpetual danger in clambering over rocks. A plain extends from Kimbira rivulet, which, though broken and rugged, is in some parts covered with grass, yielding abundant pasture for cattle. There are several small lakes here containing plenty of fish of flat shape; they are very rich, but rather bitter to the taste, and some of my men were very sick after eating them. The climate here is very rigorous, and the depredatory Kalushes migrate at the end of the summer with their steeds from one part to the other, while in spring and early summer they frequent the country to the eastward of the Ergibash ridge of low hills. When we passed here the Kalush tribe was on amicable terms with the Belor-Ombos. These tribes differ from each other in language and type. The Kalushes have

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Isalabad, just as the Marilpan appears to us to be the commencement of the Pandjkira, which discharges itself below Peshawer. These two rivers are most probably identical with those named Solet and Gurei by the historians of Alexander. Separated from the Ardinig by a single mountain range, we have taken the Badakhshan branch of the Oxus from Klaproth's itinerary translated from the Chinese, 1821: which appears, however, to have been previously known in Europe, as it is marked on Weilandt's map of Iran, published in 1837.  
—*Note of Veniukof.*

Kalmuyk faces, and are distinguished by their flat noses, and eyes set very far apart. They have no villages, but live in felt tents.\* On the 31st of May the head of this tribe paid me a visit, and I concluded a satisfactory bargain with him for horses. The horses here were not only as good as those of Gembeh and Nembeh, but likewise cheaper and more docile. On the 4th of June we remained encamped at Kulsha† lakes, where 132 excellent horses were delivered to me; and these on the following day I sent off to Bengal in charge of Lieutenant Harvey, together with my sick interpreter and eight sepoys. All these horses were unfortunately seized by the Mahrattas, causing me subsequently much unpleasantness, from which, however, I freed myself, thank God, with honour.

"Our enjoyment of the plain was not of long duration, as it terminated at Talikbar spring, where the mountains commenced again. We found it necessary to relieve our jaded camels here of a portion of their packs, which we transferred to the mules. The road led us up to Kishtur Mountain, and from its summit we descended into a valley teeming with gadflies, which irritated and annoyed our cattle exceedingly. These insects accompanied us as far as Vaghin Mountain, which stands alone in the fertile Garil Valley. A few parangs northwards, between two small salt lakes, is Fulma, the first village of the Belor-Gabsus, who closely resemble the Belor-Ombos, excepting that the villages of the former are surrounded by courts and gardens. At the foot of Kor Mountain, within a short distance of the above village, there are some mines of native copper and malachite, out of which the natives extract the ore in very solid and ingeniously constructed smelting-ovens. They are principally engaged in manufacturing kettles, which are highly prized throughout this region. Formerly very rich workings existed at Kvelbi Mountain, occurring on the north-west, where there was also a village; this mine having become exhausted is now abandoned.

"At Tahtomar, near Tahtor rivulet, a quarrel arose between my people and the natives, which might have ended very seriously, as one of my men had already been wounded in the head by a stone hurled from a sling, in the use of which the natives are very dexterous. It cost me considerable trouble to restore peace, and this I was able to do only owing to the good nature of the natives; my people being entirely to blame in the matter.

"In a broad and very deep defile, surrounded by very high escarpments, and between Valbuni and Parlunar mountains, the traveller arrives at Lake Valbuni, the water of which is bright green and apparently unfathomable. Several streams feed this lake, which contains an abundance of trout; these were often seen pursued by huge pike, locally called *bulub*. There is also a very rich copper-mine in the vicinity of Adair and Lupsi [*Lopsa*?] mountains worked by the inhabitants of Nareng village. It is from this abundance of copper

\* These were in all probability Buruts, who also nomadise on the western side of the Bolor range, along the upper sources of the Oxus, and amidst the settlements of the Belors, as is to be seen from Wood's account.—*Note of Veniukof.*

† In working in the itinerary of our traveller on the map, Lake Kulsha and the surrounding high plateau occurred exactly at that spot which on other maps is represented as the intervening part between Sary-kul, the source of the Oxus, and Kara-kul, out of which issues one of the affluents of the Yarkend-Daria. According to Wood's observations, the western extremity of Sary-kul lies under lat.  $37^{\circ} 27'$ , and long.  $91^{\circ} 20'$  of Ferro. Our traveller gives  $30'$  for the latitude of Kulsha lakes: but it must be observed that all his latitudes are excessive. If we suppose that in calculating his observations he made a mistake with regard to the sun's edge, and make an allowance of  $32'$  for the apparent diameter of the sun, we shall arrive at  $37^{\circ} 27'$ , as given by Wood. Further, our author places Cashmere at  $34^{\circ} 27'$ , whereas it is situated in  $34^{\circ} 4' 6''$ , the difference of  $32' 4''$ , being the same as that in the case of Sary-kul and Kulsha.—*Ibid.*



that the Belor-Gabsus derive their name, *Gabsu* being the native name for copper. The inhabitants of this part of the country carry on a considerable trade in this metal with Yarkend and Kashgar, selling it to the Chinese, who use it in coining copper pieces of money, called *chokhs*, out of it. The Belor-Gabsu are only indirectly subject to the Chinese. The valley to the south of the high Solgir and Klishan mountains occupied by this tribe does not belong to the Chinese.

"On the 9th of June we descended from a high mountain-ridge into a valley in which the Birtengur River\* flows from west to east, forming the boundary between the Chinese military district of Yarkend and the Belor territory.

"On some wooded heights to the left we observed the two Chinese forts of Kalga and Zartig, from which pickets were stationed along the bank of the river. When travelling through the Belor country, I assumed, by way of precaution, the character of an Armenian merchant bound to Kashgar with a small caravan. In this character the custom-house officers allowed me to pass without any difficulty, after levying only 9 per cent. on my goods and accepting some presents with which I was obliged to satisfy their cupidity. From the river I was conducted to Zartig and brought before the Chinese commandant, who enjoys the title of *uharity* (uberidy). I was supplied by him with a passport, to which was fixed a large seal called the *tungit*, and on receipt of this document I was able to continue my journey with my companions to Kashgar. In return for this passport I had to make the commandant a present of three ounces of silver. The pass proved of great service when we came to the '*uluses*' of the Chumbars (Djungars), a Kalmyk race who wander here as guardians of the frontier; all these Chumbars were mounted on excellent horses. They live in felt tents and nomadize on the neighbouring plains. The first '*ulus*' we came to while still in the wooded country was situated near two ruined towers called Zaisan-gur. Here we passed the night. On the following day we journeyed across a fine and very fertile plain as far as Boriltu† River, on the right bank of which we found Zaisang-Lobo encamped with his '*uluses*,' while on the left stood the camp of Zaisang-Korcha. On the latter bank is situated Bolorbom village, the houses of which are built of wood. The village is inhabited by 80 Belor families, who are completely under Chinese subjection, and earn their livelihood by carrying on a trade with the neighbouring tribes and the Tartar traders of Kashgar."

After remaining at Kashgar our traveller proceeded westwards along the river Yapuar, and subsequently again entered the country of the Belors, near Kara-kul Lake.

"About ten years ago," he states, "a battle was fought between the Chinese and Belors, terminating in the subjection of the latter; this engagement took place between Alalyk and Ulgatch mountains, south-west of Kara-kul. The Belors held the Kerlat Pass in the Teguzlyk Valley, while the Chinese were posted on the shores of Kara-kul Lake. The Chinese General Kulingtu had about 5000 horsemen with about an equal body of infantry, a

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\* Klapproth on his map calls this river the Chagan-Ussu, or Aksu.—*Note of Veniukof.*

† In the Chinese itinerary translated by Klapproth in 1821, the River Boroldai is given as one of the eastern affluents of the Bolor. Most probably it has a common source with the Boriltu (the Manchu-Chinese mode of pronouncing Boroldai), as according to Asiatic custom two rivers issuing from the same mountain, though in different directions, are called by the same name.—*Ibid.*

small portion of which was armed with matchlocks. He was also reinforced by several thousand Buruts, and disposed of 22 *dzimburiks* or guns. The Belors numbered 15,000 men, and might without difficulty have held the pass with a twentieth of their force: they, however, had the rashness to come out with their whole strength into the rocky valley leading from Ulgatch Mountain to the source of the Kir-Agatch River, with a view of attacking the Chinese in the rear. But the Chinese general, learning their plan from two fugitives, sent messengers to the Kalnyks and Buruts stationed in reserve in the Yapunar Valley, and there, bringing up their guns, fell on the Belors at Kir-Agatch, surrounded them, cut the greater part of them to pieces, and entered Ulgatch Valley on the heels of the fugitives, appearing in this manner in the rear of the Belors. The Chinese General, on hearing the cannonade, attacked the enemy in front, and the unfortunate Belors finding themselves between two fires were forced to capitulate. The reigning Belor family fell into the hands of the victors, and were despatched to Peking, where they were executed. The same Chinese general who subjugated the region governs it at the present moment.

"On the 26th of June we halted at this pass, which really is the key to all the countries lying to the eastward, as all the roads leading from the westward converge within a short distance of it. It is surprising that the inhabitants of this region, although they built the fortifications, of which the ruins are still visible to the south of the defile, did not also fortify the Pass itself, which could be done with very little trouble. The excellent single-arched stone bridge built by them over the Aksu is still in existence. We passed the night on a considerable eminence rising at a distance of half an *aputch* to the south of the bridge. The rapid Pana rivulet, which rushes through a narrow and rocky ravine in the direction of the Bolor River, takes its rise at this point. We passed an encampment of some of the nomadising Chingir-Gerbass at the mouth of the latter river,\* and we afterwards found their tents scattered along the whole course of the river as far as the town of Bolor. There are many ruins scattered throughout this deep and awfully gloomy valley, which would lead to the supposition that it was at one time inhabited by a settled race.† It is said that the capital of this people stood near Kaolit Mountain, and spread along both banks of the Mingis rivulet, where many ruins are still to be seen. I was fortunate enough to obtain two silver coins, found on this spot; on the obverse side of one of these was a human face surrounded by rays of light, and the reverse side bore an inscription in characters quite unintelligible, though resembling somewhat the Syriac writing I afterwards saw in Mahometan books at Samarcand. But these also the mullahs were not able to decypher.

"After crossing the Kuzluk rivulet we entered a dense forest called Kasbatu, which stretches over an extent of 12 *aputch* in a south-westerly direction to the very borders of Badakhshan. On the right bank of the Bolor we encountered a large horde of nomads, amongst whom I remained for several days buying horses. I purchased 980 horses in all from them, and despatched them to Kashgar in charge of one of my men, in whose care I also forwarded two copies of the account of my journey, together with all the geographical maps that had been completed by me up to that time. I deemed it advisable to take this precaution so as to ensure them against accidents that might befall me.

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\* On Klaproth's itinerary the camping-grounds of the Chingirs are also shown in close proximity to Dzaryk-kul.—*Note of Veniukof.*

† With respect to the Belor kingdom, we learn from Huen-Tsan and the Chinese geography, that Chakhu-Hamed, the ruler of this state, became subject to China in 1749.—*Ibid.*

"Between Absulash and Elirator mountains there is a large mine of native cinnabar, which is worked by the inhabitants of these parts, and the produce disposed of at Bolor and Badakhshan in its native state and in the form of mercury. This mine yields 40,000 ounces of silver. Among the wandering Belor-Chinis we tasted some very strong spirit which they called *telik araki*, and distilled from black berries resembling cherries."

Here we shall conclude our extracts from the account of the 'Journey through Upper Asia.' On the 3rd of July Georg Ludwig von — reached the town of Bolor, and remained there several weeks, at the request of the Chinese General, proceeding afterwards to Badakhshan, with regard to which town he observes, consistently with the testimony from other sources, that it is peopled by Mahometans. At this point of his journey Georg Ludwig von — quitted for a time the country of the Belors and entered that of the Tadjiks. From hence he again journeyed northwards, and must have once more encountered the former race, namely, at Vokhan. I say *must have*, because one passage in the Chinese geography adduced by Klaproth\* bears incontestable evidence of Vokhan being peopled by an Indian race, differing entirely from the Mahometan Buruts, Turkistanis, and Tadjiks. I have already given some account of Vokhan in my article on the Pamir, I shall therefore merely observe here, that the Chinese geography and itinerary translated in 1821 bear uniform evidence that a road runs from this small town to Kashgar, past Lake Djarik-kul, or immediately across the axis of the Bolor Mountains. This doubtless is the same road along which the Chinese general Fu-dé proceeded to Badakhshan with a large army when in pursuit of Boronda and Hozitchman, so celebrated in the history of Eastern Turkestan. It is interesting to find that the Chinese geography affords us an idea of the former populousness of these parts. According to this testimony, the small Bolor territory contained, towards the middle of the last century, a population of 30,000 families in the valley of the Bolor River; while that of Badakhshan amounted to 100,000 families. From this it will be seen that this region is not so thinly inhabited as its mountainous and elevated situation would lead one to suppose.

In order to elucidate the accompanying map, I shall now in conclusion recur to some of the accounts given by other European travellers, namely, Burnes and Wood, respecting the limits of distribution of the Belors and other Kaffir tribes. The first of these travellers distinctly states that the inhabitants of Badakhshan are

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\* Klaproth, 'Magasin Asiatique,' vol. i. p. 92. I am inclined to think that the Belors partly populate the northern portions of Badakhshan, if we may judge from the local names of objects in that part. In constructing my map, however, I did not venture to adopt this supposition, chiefly because it is scarcely possible that the heathen Belors could remain independent subjects of a Mussulman kingdom like Badakhshan.—*Note of Veniukof.*

Tadjiks, *i.e.* a race akin to the Iranian Persians. It is only the rulers of this principality who lay claim to a descent from Alexander the Great, that is to say, to a non-Asiatic origin. Hence it would appear that the Belors do not spread into the valley of the Sharud, and are most probably confined to the valley of the Bolor River. On the other hand, however, we read on the same authority that the Khan of Kunduz had succeeded in subjecting Chitral to his rule, and was in receipt of tribute from this town in slaves, whom he usually despatched to Bukhara for sale. This, again, evidently refers to unbelievers or Kaffirs, who, as Burnes states, speak a distinct dialect. Wood likewise, in the valley of the Amu-Daria, or Pandj, beyond Ish-Kashm Pass, met with a strange race of people who interested him no less than the Pamir Kirghizes, these latter having strayed beyond their usual haunts at the period of Wood's visit. He informs us that among the former he found some traces of the doctrines of Zoroaster, and also saw two ruined temples. All this testimony tends to define the western limits of prevalence of this enigmatical race; while with regard to their northern limits of distribution, we possess the testimony of our traveller Georg Ludwig von — in two places of his narrative, and also of that of Klapproth. The southern limits of the Kaffir-Sahpushes have for some years past been pretty accurately defined on European maps, from the accounts supplied by Elphinstone, Burnes, and others. Their eastern limits, however, the evidence of Chinese geography notwithstanding, cannot yet be fixed with any certainty in the absence of more accurate ethnological data. In all probability the inhabitants of Iskardo, Gilgit, and of the parts adjoining Karshu are of this race. To prove this it is requisite to obtain correct physiological and linguistic data. Even a brief vocabulary of the dialect spoken there would be of the greatest value; and a philological examination of the words of the dialect of Chitral, cited by Burnes, and of the dictionary of the Dardu language, compiled by Cunningham, would prove exceedingly interesting.

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XXI.—*On the Exploration of the North Polar Region.* By  
Captain SHERARD OSBORN, R.N., C.B.\*

*Read*, January 23, 1865.

ARCTIC discovery, however imperfectly treated, must always, I feel sure, claim the attention of all true lovers of geography and physical science, especially that of a Society which, in its present prosperity, represents the deep interest recently exhibited by all

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\* Reprinted, by order of the Council, from the 'Proceedings,' vol. ix.

grades of the public in the solution of the problem of a communication between the Pacific and Atlantic, and of the world-wide sympathy in the noble devotion by which that mystery was solved.

I need not, therefore, offer an apology to the members of the Royal Geographical Society for any effort upon my part to show the perfect practicability of an exploration of the blank space around our Northern Pole, and to place before you opinions entertained by myself, and those of my brother Arctic explorers who do *not* belong to the new school of "rest and be thankful" men, either in science or naval achievement, and who are no more prepared to turn their backs upon the Arctic Regions because Franklin died off King William's Land, than you would wish them to do so to an enemy's fleet, because Nelson fell at Trafalgar.

In the year 1818, Baffin's discoveries upon the one hand, and those of Behring upon the other, with dots for the mouths of the Mackenzie and Hearn rivers, was all we knew of the strange labyrinth of lands and waters now accurately delineated upon our charts of the Arctic Zone. Sailors and travellers, in thirty-six years, have accomplished all this: not always, be it remembered, in well-stored ships, sailing rapidly from point to point, but for the most part by patiently toiling on foot, or coasting in open boats round every bay and fiord. Sir Leopold McClintock tells the Royal Dublin Society that he estimates the foot explorations accomplished in the search for Franklin alone at about 40,000 miles. Yet during those thirty-six years of glorious enterprise by ship, by boat, and by sledge, England only fairly lost one expedition, and 128 souls, out of forty-two successive expeditions, and has never lost a sledge-party out of about one hundred that have toiled within the Arctic Circle. Show me upon the globe's surface an equal amount of geographical discovery, or in history as arduous an achievement, with a smaller amount of human sacrifice, and then I will concede that Arctic exploration has entailed more than its due proportion of suffering.

They who assert that our labours and researches have merely added so many miles of unprofitable coast-line to our charts, had better compare our knowledge of Arctic phenomena to-day with the theories enunciated by men of learning and repute a century ago. They should confront our knowledge of 1864 with that of 1800 upon the natural history, meteorology, climate, and winds of the Arctic Regions. They must remember that it was there we obtained the clue, still unravelled, of the laws of those mysterious currents which flow through the wastes of the ocean like two mighty rivers—the Gulf Stream, and the Ice Stream; they must remember that it was there—in Boothia—that the two Rosses first reached the Magnetic Pole, that mysterious point round which

revolves the mariner's compass over one half of the Northern hemisphere; and let the world say whether the mass of observations collected by our explorers on all sides of that Magnetic Pole have added nothing to the knowledge of the laws of magnetic declination and dip. They should remember how, a few years ago, it was gravely debated whether man could exist through the rigours and darkness of a Polar winter, and how we have only recently discovered that Providence has peopled that region to the extreme latitude yet reached, and that the animals upon which they subsist are there likewise, in winter as well as in summer. All this, and much more, should be borne in mind by those cynics who would have you believe we have toiled in vain; and I hold, with the late Admiral Beechey, "that every voyage to the North has tended to remove that veil of obscurity which previously hung over the geography and all the phenomena of the Arctic Regions. Before those voyages all was darkness and terror, all beyond the North Cape a blank; but, since then, each successive voyage has swept away some gloomy superstition, has brought to light some new phenomenon, and tended to the advancement of human knowledge."

I will not dwell upon the personal hardships or risks incurred—they can be easily discounted at any Insurance Company in the City of London, and the privations are best appreciated by those who have been sledging over the barren grounds of  $76^{\circ}$  N., and are not scared by the recollection of cold fingers and banian days. Men do not volunteer for certain death or starvation, and I can only say that so popular is Arctic service with our sailors, that I am frequently asked by old shipmates, "Are we going up that way again, sir? Please don't forget I am a volunteer!" The fact is, more sailors have been thrown to the sharks from the diseases incident to service in China and the coast of Africa, within the last four years, than ever fell in thirty years of Arctic service, and our seamen and officers know it. And, after all, the dangers of exploration in the north are those common to like undertakings in all unknown regions—Speke and Grant seeking for the sources of the Nile, Burton at Harar, Freemont in the Sierra Nevada, Livingstone on the Zambesi, or Burke and Wills in the hungry wilds of Central Australia, have all moments of as great peril as Kane ever endured in Smith Sound, or McClure passed through in Banks's Land.

I will, therefore, without further preamble, deal with the points which are the most important for our consideration.

*First.* The direction from which a Polar exploration should be undertaken with the least risk and greatest probability of success.

*Second.* The mode in which such an exploration should be executed, and the scientific results likely to accrue.

We have before us a circumpolar chart. Mark the nearest known points to the Pole—the extremes of Spitzbergen and North Greenland. Let us first deal with Spitzbergen. Hakluyt Head is about 600 miles from the Pole: in the last century the whale fishery was situated off that Cape, and we have the concurrent testimony of all those ancient fishermen to prove that the sea was often found clear of ice for another hundred miles further north. I say, therefore, that sailing-ships have been in that direction within 500 miles of the Pole. For the information of those more sanguine than myself of the existence of open water at the Pole through the action of the Gulf Stream, I annex a table collated, by my kind friend Mr. Markham,\* from the data furnished to the Royal Society by the Hon. Daines Barrington, Colonel Beaufoy and others. You will there find that stout old Dutch and English skippers vowed they had been as far north as the  $88^{\circ}$ , some to  $83^{\circ}$  N., and many into the  $82^{\circ}$  parallel: indeed one old sailor declared to Master Moxon, hydrographer to Charles II. of glorious memory, that “he had sailed two degrees beyond the Pole!” but it is only fair to add that this was said in dreamy Amsterdam, over strong Dutch beer.

I am content, however, to point to the position reached by the late Sir Edward Parry, in his boat expedition from Spitzbergen in 1827. There, at any rate, he stood upon a floating sea of ice on the night of July 22, 1827, being then in lat.  $82^{\circ} 45'$  N., exactly 435 geographical miles from the Pole. He was constrained to give up the attempt simply because the ice was being swept faster to the south than his men could drag their boats to the north. It was the height of the Arctic summer, and all the ice-fields were in motion. The experience of the last twenty years tells us that instead of starting on such a journey in June, Parry ought to have wintered in Spitzbergen, and started for the North in February; and such is the perfection to which Arctic sledge-equipment is now brought, that the weights would be infinitely less for the men to drag, whilst the provisions would last months instead of weeks.

But there are great objections to any effort to reach the Polar area by sledges from Spitzbergen. You will observe as yet no known lands exist upon its meridian and to the north of the island; consequently no fixed points for depôts of provisions: whereas, in Smith Sound, we have a starting-point 120 miles nearer to the Pole, and there is good ground for believing (as I will show) in a further extension of continents or islands upon the meridian of the American and Greenland continents, which is not the case in Spitzbergen. For instance, the floes which drift down upon Spitzbergen from the north contain in their embrace no icebergs proper.

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\* See p. 295.

This tells us that no extensive lands lie upon that meridian; for the iceberg is a creation of the land, born of a glacier, and not of the sea: whereas these icebergs abound in Smith Sound; and the glaciers, as Kane advanced northward, appeared to increase rather than diminish in extent, which would not be the case if the land ended abruptly near the Humboldt Glacier, in  $80^{\circ}$  N. latitude.

Those vast accumulations of snow and fresh-water ice, and their beautiful creations the iceberg, tell us of great lands with lofty mountains and deep valleys retaining the moisture and snow-drift of ages, and promise that continuity of coast-line, and that frozen seaboard, which is only needed to enable our explorers to reach the Pole in safety. Greenland, therefore, and not Spitzbergen, is the direction I advocate. At the same time, do not jump to the conclusion that there is nothing to reward the explorer in the direction of Spitzbergen or Nova Zembla, for there is much yet to be seen and done there in scientific research. The bugbear of Arctic navigation is being gradually dispelled. 'A Cruise in High Latitudes,' and 'A Season among the Walruses,' encourage us to hope, that where yachtsmen have not hesitated to go for pleasure, and where poor Norwegian fishermen yearly sail in almost open boats for hides, ivory, and the more precious livers of Arctic sharks, which produce, as you know, "pure cod-liver oil!" it is possible others will yet wend their way for love of science, and add to our knowledge of the laws of electricity, light, magnetism, temperature, and winds.

From Spitzbergen let us turn to Greenland. In the year 1853 my lamented friend Dr. Kane entered Smith Sound, at the head of Baffin Bay, with his little brig, the *Advance*. At that time I was serving with Capt. Richards, the present Hydrographer of the Navy, in an expedition in Wellington Channel, under Sir Edward Belcher; Kellett and McClintock were in Barrow Straits, McClure had just reached the waters of the Atlantic from the Pacific Ocean, Collinson and Rae were in Victoria Land and Boothia, and Inglefield had just made one of his summer trips to Beechey Island. There could not have been less than four hundred British subjects within the Arctic seas. All our ships had been admirably found, and our crews lived in comparative comfort, for the resources of a nation and a great navy had been placed at our disposal. Dr. Kane's expedition was rather the result of private munificence, and a generous impulse of individuals; and it is only fair to Dr. Kane to say, that never in our times has a navigator entered the ice so indifferently prepared for a Polar winter. With only seventeen followers, two of them mutineers, without a steam-power for his solitary vessel, without proper sledge-equipment, without any preserved fresh meat, and a great insufficiency of



preserved vegetables, and with only coals enough to serve for twelve months' fuel, the only marvel to me is, that he ever returned to relate his sufferings. They are only to be equalled by those of the navigator "James," in Hudson Bay, two centuries earlier. God forbid that I should be thought to cast one reflection upon those warm-hearted Americans who came nobly forward, and said, "We too will aid in Arctic enterprise;" but the fact is, that enthusiasm and high courage without proper knowledge and equipment must, on such service, infallibly lead to the suffering which Dr. Kane's followers endured; and it is *that* which best explains how it was, that whilst our sailors, far beyond the present haunts of Esquimaux, waxed fat and fastidious, Kane's poor followers had to eat the raw flesh of animals to avert the ravages of scurvy brought on by a poisonous dietary of salt-meat. This much to meet the objections of those who point to Dr. Kane's thrilling narrative with a view to frighten us from Arctic exploration; and I may add, that I know well that chivalrous man never penned those touching episodes to frighten men from high enterprise, but rather to caution us to avoid his mistakes, and to show us how nobly the worst evils may be borne when the cause is a good one.

The brig *Advance* entered Smith Sound, but departed from an Arctic canon by keeping upon the eastern or lee-shore instead of the western or weather shore; she was quickly beset, and fell into a bay 60 miles further on, out of which she never again sailed.

In the spring of 1854 a further exploration was accomplished, of about 160 miles of the Greenland coast, and the western land was observed for a still greater distance. The extreme of Greenland visited was a point beyond a stupendous tongue of the great glacier, and named Cape Constitution by the only man (Mr. Morton) who reached it. This sailor could not get round the Cape because of water existing at the base of the cliffs; he could not scale the cliff, because it was too steep; what more there is, therefore, beyond Cape Constitution, none of us know. Kane thought it the termination of Greenland. I entirely dissent from so hasty a conclusion, because I cannot believe that such a glacier as that of Humboldt, ever bearing the hundreds of icebergs, which Kane tells us of, into the waters of Smith Sound, was fed otherwise than by some extensive parent-glacier spread over a very great area; and this proclaims, in my opinion, a continuity of the Greenland shore, as there was, undoubtedly, land on the opposite side as far as Morton could see.

Scrambling up the face of Cape Constitution, to the height of either 300 or 500 feet, Mr. Morton could see no ice to the westward; to which I attach small importance, never having myself seen floe-ice from any altitude at a greater distance than 12

miles; but he did see land rolling away to the northward, a bold but indented coast, he thinks, with a fine range of mountains looming in the interior. This land is appropriately named Grinnell Land.

English and American hydrographers are at variance as to the assigned latitudes of Cape Constitution and Cape Parry, the two extremes discovered by Kane. I sincerely trust the American computation will prove correct. Cape Constitution will then be in  $81^{\circ} 22' \text{ N.}$ , and the point seen on the west land would be in about  $82^{\circ} 30' \text{ N.}$ , or just 450 miles from our Pole, a distance equal to that of the Land's End from Balmoral.

But in order that we may deal with the subject from its worst point of view, I am prepared to accept the more southern positions assigned to the extremes by Admiral Collinson, Captain George, and Mr. Arrowsmith. They, as you will observe, place Cape Constitution in lat.  $80^{\circ} 56' \text{ N.}$ , and credit Morton's vision with a range of 60 miles; fixing Cape Parry in lat.  $81^{\circ} 56' \text{ only}$ , or a distance of 484 miles from the Pole. I accept this as the distance we have to deal with, and declare that Cape and Grinnell Land as my assurance of the perfect possibility of reaching the Pole.

Cape Parry is, as you see, a fixed point more than a degree and a half nearer to the Pole than Hakluyt Head, in Spitzbergen, and therefore the best point of departure for the exploration of the great unknown space before us.

The distance of Cape Parry to the Pole and back is just 968 miles; a distance which has been repeatedly exceeded by our Arctic sledge and boat parties since the year 1850, and far short of what we subsequently accomplished, as I will presently show.

But, apart from mere proximity to the Pole, there are other conditions which recommend this route to our consideration. It will be remembered that at Cape Constitution a considerable extent of water was found to exist in the early summer. Recent Arctic explorations have taught us that this is no great novelty. Dr. Kane, however, believes it to be very extensive; but, as I have good reasons for being sceptical upon this point, and as the Pole is within our reach whether Kane's Polynia be great or small, I shall not urge the facilities which open water offers to a boat-navigation. The future explorer might hail open water if it were found to exist along the shores of Grinnell Land; but, if not, he would be well satisfied with plenty of ice, and merely pray that the mainland or off-lying islands should be found to exist as far as the 87th parallel. And there is, I hold, more chance—far more chance—of that being the case, than of any open sea round our Arctic Pole.

But Kane's Polynia evidently exists where there is a far greater

abundance of animal and vegetable life than we have found to exist round the *waterholes* of Regent's Inlet, Wellington Channel, or Lancaster Sound. The possibility, therefore, of future explorers of Smith Sound being able to vary their dietary with the flesh of deer, bear, seal, or wild-fowl, is an important recommendation to the route in question.

In this meridian, too, we find human life extending to a higher latitude than in any other known direction. A fine tribe of Arctic savages was first discovered by Sir John Ross in lat.  $75^{\circ} 35' \text{ N.}$ , long.  $65^{\circ} 32' \text{ W.}$ , in his voyage of 1818. Ross christened this isolated section of the great Esquimaux race, "Arctic Highlanders." Through his interpreter, Sackense, he learnt that their tribe dwelt to the northward of the great glacier of Melville Bay; by it they were entirely cut off from all knowledge of anything in that direction, and when Ross told them that his ship had come from the south, they replied—"It was not true; there was nothing but ice there!" Subsequent Arctic expeditions, as well as whale-ships, have had intercourse with these people and so far conciliated them, that instead of offering to kill Europeans, as they threatened in 1818, we find them in 1854 positively saving Kane and his followers from starvation, and cheerfully sharing food and lodgement with the poor sailors. Of this isolated group of the human family Dr. Kane gives us a very interesting account. Having no boats, nor a knowledge of how to construct them out of bones and seal-skins, as other Esquimaux do, afraid to cross the two great ice-streams of Melville and of Humboldt, these poor creatures inhabit a region between the prongs of the Greenland Glacier, which embraces about 600 miles of coast-line, and they cannot penetrate far into the interior, for there, they said, was the "Sernik Soak," or Great Ice Wall!

Without any drift-wood, except a fragment of wreck at rare intervals, the Arctic Highlander is compelled to use bones alone in the construction of his sledge and weapons. The latter consist simply of knife, harpoon, and lance, bones lashed together with an iron point or edge ingeniously fitted from fragments of meteoric iron found in the country, or from scraps of iron hoops which reach the coast upon the casks of wrecked whalers. Without a bow or arrow, they are unable to kill reindeer or musk-oxen; the former range unmolested over the barren uplands at the base of the glaciers; and the art of fishing is likewise unknown, for Kane saw lakes full of salmon-trout, which the Arctic Highlander could not catch. With his spear and harpoon, however, he slays the bear, seal, and powerful walrus; and in summer time nets vast quantities of the little auk, a delicious morsel well appreciated by all of us who have visited those Crimson Cliffs of Beverley, as Ross poetically named their haunts. These people are thus dependent for

subsistence upon the flesh of marine creatures, and consequently upon the existence of broken ice, or open water near the coast, throughout every season of the year. Without it they would all perish in a single winter. But a Beneficent Providence has so arranged it that from the action of oceanic currents, and the destruction of the ice-fields by the large icebergs thrown off from the glaciers constantly sailing through them, there is always, even in the depth of a Polar winter, some "North Water" to be found, and in it walrus and bear. The land, as I have said, yields these Arctic fishermen no animal food, neither can I discover an instance of their ever having been seen to partake of a single herb, grass, or berry grown upon the shore; of vegetables or cereals they have, of course, no conception, and I know of no other people on the earth's surface who are thus entirely carnivorous. Kane says they must be an expiring race. I can find no proof of it, though no doubt, like all savage races, they are doomed to pass away or merge into those of a superior organisation. Where Ross found the Arctic Highlanders in 1818, they exist in 1864, and from occasional contact with Europeans have rather improved than deteriorated. All who have seen them, and I am one, describe the men as square-built, hearty fellows, deep-chested, bass-voiced, and merry-hearted. Ready to fasten on with their harpoon to a fierce walrus, and, line in hand, struggle for life with it upon the weak ice; or, aided by their dogs, bring the Polar bear to bay, and close in upon it with lance and knife; yet these poor savages showed in their kindness to the starving and not always rational crew of the *Advance*, that they were not deficient in the nobler attributes of our common nature. Their women, good souls, were tender and sympathetic in their quaint way, for it is not every European mother who would lend a nice warm babe to make a soft pillow for a weary traveller, as the ladies of Etah did; and the spinsters of Smith Sound were fair enough to win the hearts of some on board the *Advance*. Indeed, more than one little scandal related leads me to believe that, in spite of the struggle for existence in 80° N., the unwashed, sealskin-clad beauties of Murchison Sound have their little flirtations, as well as their sisters of ampler robes in more southern climes. "One touch of nature makes the whole world kin;" and I know nothing more strange in all Arctic adventure than when Kane was escaping southward, to find his faithful hunter, Hans, voluntarily abandoning him and turning Arctic Highlander all for the love of Shanghai's pretty daughter—she had gently tended him when injured in a walrus-hunt. The elopement of the fond pair upon a bone-sledge, drawn by wild dogs, is perfect as an Arctic love-scene: but, unfortunately, Hans was already a married man. "Alas for Hans!" Dr. Kane pathetically observes. I say, "Alas for Miss Shanghai!"

It has not been without a purpose that I have thus touched upon the habits of the Arctic Highlanders. I have endeavoured to show you that, though carnivorous creatures, they are, after all, much as we are in other respects: it tells you that there, in Smith Sound, inhabitants exist who have helped the European and can do so again; and, above all, their existence is an incontestable proof of an amount of animal life being found in that latitude throughout the year and in all seasons.

Kane says that his Arctic friends would not carry him beyond the Humboldt Glacier, and seemed to have no knowledge of lands to the north. Yet Morton found a fragment of an Esquimaux sledge on shore between that glacier and Cape Constitution. May it not be that other Esquimaux exist there? and does not the question occur to you, How far does human life extend in Smith Sound? May it not reach much nearer to the Pole than even where Kane found it in 80° N. So far as we know, the Arctic Highlanders are confined to the Greenland shore; and for our purposes of exploration it would be well it were so. They would then be near enough to aid as hunters and sledge-drivers, and not so close as to endanger good order and discipline amongst a crew in hours of trial or suffering.

There is one more reason for preferring this route to any other, viz., that the Danish settlements extend along the coast of Greenland as high as 72° N. Kane in open boats carried off his men in safety to Upernavik, when it became imperative to do so; other navigators could do likewise, if any accident occurred to their ships in Smith Sound. Trusting I have shown the right direction in which the proposed exploration should be attempted, I will now sketch out the mode in which it should be carried out; for the details would be too technical and voluminous to interest all geographers.

An exploration of the Polar area should always be sent under naval auspices and naval discipline. I have no faith in purely private expeditions on such a service as this I advocate. We need all the resources of a naval dockyard, all the especial knowledge collected in various departments—whether in the preparation of vessels, food, raiment, sledges, or equipment—to insure the work being well and safely done. Wooden ships-of-war are now rotting and sinking at their anchors in our arsenals: all the old ladies round our seaports are cooking their tea with heart-of-oak from poor chopped-up gunboats. We don't want three-deckers, but you might have them for the asking; you can be more modest, and ask for something much smaller than wooden line-of-battle-ships. Of course you will not expect the Admiralty to take the initiative in such matters. Columbus would never have reached the new continent; the immortal Cook would never have made his voyages

round the world; the illustrious names of Franklin, Ross, and Parry would not have been added to the rolls of fame; if you had waited for past Admiralties to originate scientific research and geographical exploration.

But I have no doubt men of science—men who think the Navy and its officers and sailors exist for nobler purposes than to slay or be slain—will find His Grace the Duke of Somerset just as amenable to reason and healthy pressure as former First Lords have been. The Board, like other Boards, will, as good servants of the public, do whatever the public calls upon them to do; and it is by the action of public opinion, directed by the men of science in this country, that I hope to see a Polar expedition sent forth in this generation under naval auspices. The Navy needs some action to wake it up from the sloth of routine, and save it from the canker of prolonged peace. Arctic exploration is more wholesome for it, in a moral as well as a sanitary point of view, than any more Ashantee or Japanese wars.

You are not going to educate us, work us up to the point of nautical perfection, awaken hopes and ambition, and then give us oakum to pick, or run us over the mast-head after top-gallant yards, to keep down the spirit which intellectual progress has evoked. The navy of England cries not for mere war to gratify its desire for honourable employment or fame. There are other achievements, it knows well, as glorious as victorious battle; and a wise ruler and a wise people will, I hold, be careful to satisfy a craving which is the life-blood of a profession—indeed, I hold that it ought to be fostered and encouraged.

Upon these grounds, as well as those of scientific results, would it be too much to ask for a fraction of the vast sum yearly sunk in naval expenditure, for two small screw-vessels and 120 officers and men, out of the 50,000 men annually placed at the disposal of the Admiralty?

Let us suppose it granted, and two vessels like the *Pioneer* and *Intrepid* ready by the spring of 1866. They would sail for Baffin Bay, reach Cape York in August, and one vessel would be secured in or about Cape Isabella, leaving only twenty-five persons in charge of her; the other vessel, with ninety-five souls, would be pressed up the Western shore, either as far as Cape Parry or in that direction, taking care not to exceed a distance of 300 miles from her consort. That autumn the southern ship would connect herself by dépôts with the northern vessel, and the northern vessel would place out dépôts towards the Pole ready for spring operations.

In 1867 and 1868 sledge and boat operations should be directed towards the pole and over the unknown area, and in 1869, either in ships or by boat to Upernavik, our expedition would retire from Smith Sound. They would thus only have two winters and three

summers to encounter ; a period which experience has taught us healthy men, with proper care, can well spend at a time in those regions.

With respect to the distance to be traversed by sledge, we have ample data to show that it has been exceeded by our sailors and marines in the most sterile land yet visited within the Frigid Zone. For instance, in 1853, Commander McClintock's party did 1220 geographical miles in 105 days ; Lieutenant Meham did 1203 miles ; and Captain Richards and I did 1093 miles. Mark, that all these distances are in excess of the 968 miles between Cape Parry and the Pole. Lieutenant Hamilton did 1150 miles with a dog-sledge and one man. Yet, in subsequent expeditions to those of 1853, still longer marches have been accomplished, and the men suffered still less. In 1854 Meham marched 1157 miles in only seventy days, a gain of a month in time, equal to a distance of 300 miles more had it been necessary ; and in 1859 Captain McClintock actually accomplished 1330 miles and Young 1150, and that distinguished officer Sir Leopold McClintock agrees with me in thinking that it is quite possible with proper management to extend a journey over a distance of 1500 miles, or just 500 miles more than are required to take a sledge from Cape Parry to the Pole and back. Thanks to hard-earned experience, we have learnt in ten years to double the period a sledge-party may support itself away from the ship, and trebled the length of the journeys to be accomplished ; yet at the same time reduced the labour of the seamen and the personal risk to its minimum.

I am not vain enough to suppose my unsupported opinion of the practicability and safety of a sledge-exploration of the Polar area would suffice to convince you all ; but I can confidently appeal to an officer of far greater experience, Captain Sir Leopold McClintock. He, writing to me in December last, says : " I am glad you are poking up the embers of Arctic discovery. I wish I were now preparing for a trip to the North Pole. I regard it as being within the reach of this generation ; for knowledge, as you know, is power in sledge-travelling." Can you doubt the practicability of such an exploration, I say, after such a declaration from an officer who has spent seven winters and ten summers in these seas ? I am sure you will not ; and that you will say with me, that of all men he is the best fitted to-head such an expedition.

3rd Point. We have now to consider the final portion of my argument :—The advantages to be derived from an exploration of the Polar area.

In the first place, you as a scientific body have before you an unknown area of 1,131,000 square miles of the globe's surface a sheer blank. Within that area you are profoundly ignorant whether there be lands or waters ; whether, as some say, it is a

silent frozen solitude, or an open sea teeming with animal life. So far as you as yet have explored in that direction, you have found the land capable of supporting not only animal, but human life.

Moreover, as connected with physical geography, you have in 80° of North latitude reached the only known spot where Nature yields to man no plant, herb, or grass, which he uses for food or nutriment. Yet, imperfect as the botanical exploration of that spot has been, we learn from the report of the able American botanist, Mr. Durand, that although Dr. Kane lost the major portion of his collection, the remainder "was yet the richest and most interesting ever brought by Arctic or Polar explorer;" and Kane added no less than *twenty-seven species* of plants to the list recently published by that eminent Arctic naturalist Sir John Richardson, as existing to the north of 73° of latitude. Proving that, at any rate, there was an error of 50 per cent. in the botanical geography of the region under consideration.

To botanists, therefore, as well as geographers, there is everything to be discovered within the Polar area; and not only the botany of the land, but that of the sea, and of the fresh-water lakes and rivers flowing from the glaciers of that ice-bound region. Immediately in connection, too, with the distribution of the animal and vegetable kingdoms of the Polar Basin, we have to solve more than one strange anomaly in the climate that has been noticed upon its margin.

The lowest known winter mean temperature has been recorded by Dr. Kane, in the very region which is so rich in Arctic flora, where the natives can support themselves alone upon the chase of marine creatures, and where the reindeer are so abundant that a traveller subsequent to Kane shot 600 head, and supported his party upon fresh food throughout a long winter.\* There, in Rensselaer Harbour, with open water not far to the south, with open water, as he believed, not far to the north, Kane records a winter mean temperature lower than we have found at Melville Island, where at that season we feel sure that there was no open sea nearer than the Mackenzie River, or the entrance of Lancaster Sound. Mr. Schott, the able American meteorologist, puzzled with the anomaly of so low a temperature near the reported open Polar Sea, says that "it points conclusively to either a considerable northern extension of Grinnell Land on the one side and an eastern extent of Washington Land on the other, or to a considerable elevation of the interior on both sides of the channel above its level," and acknowledges that his conclusions are at

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\* Mr. Cornelius Grinnell informs me of this interesting fact connected with Dr. Hayes' second visit to Smith Sound.



variance with the supposed existence of an ocean around the Pole free for navigation.

The fact is, that meteorology is quite as much at fault there as elsewhere when it proceeds to theorise upon insufficient data. And, in a scientific point of view, I maintain that nothing could be more deeply interesting than a careful series of meteorological observations within the Polar area. Its climate is, as I have shown, a mystery; and Kane's rough observations require to be verified, as well as those of our searching-expeditions, by sending out a scientific expedition, with people well versed and earnest in that science alone.

In geology, and especially in the phenomena of those stupendous glaciers, as well as the great ice-streams of Humboldt and of Melville, there is much to repay the future explorer of Smith Sound. In the presence of men so eminently qualified to point out what is most deserving of scientific investigation under these heads, it would ill become me to do more than advert to the subject. Indeed, I feel I owe an apology to all men of science for even daring to touch upon subjects of which I as a sailor can have only the most fragmentary knowledge. But I am also addressing myself to those who know little of such subjects, and who may be carried away by the cuckoo cry of "*Cui bono?*" in discussing further geographical exploration. The learned Council of this Society are not likely to say so, I know well, or to ask me to demonstrate the necessity for further scientific research based upon an argument touching whale-oil, whalebone, walrus-hides, seal-blubber, narwhal-ivory, deer-skins, peltry, or Upernavik graphite. I should as soon think of urging the exploration of New Guinea upon the speculation of profits arising from the tails of birds-of-paradise or edible birds'-nests.

No! I put the question before you upon purely scientific grounds; and I ask you—the Geographical Society—if you are not satisfied with the geographical harvest that awaits you there, to turn to the Royal Society and ask the learned Council whether there is anything likely to repay the explorer of the Pole for his labours? I can confidently appeal to its President, General Sabine. He is to-day the senior living officer of those who accompanied Ross and Parry in their early explorations of the Arctic Zone. In Spitzbergen, Melville Island, and East Greenland he collected those valuable data in terrestrial magnetism which have subsequently led to the construction of those beautiful charts exhibiting the declination, inclination, and intensity of the magnetic force over the globe's surface—a wonderful reduction of scientific data to good, useful purposes, which every sailor can appreciate and be grateful for. And does he tell us that there is nothing more to

be done in the Arctic Zone? On the contrary, in General Sabine's Address to the Royal Society, on November 30th, 1863, he dwells especially on the pleasure with which he learns that the Swedish Government are about to carry out in Spitzbergen that measurement of an arc of the meridian, the value and importance of which the learned General had urged forty years ago upon the attention of the British public, and which, he says, "I had planned the means of executing, and which I ardently desired to be permitted to carry out personally."

General Sabine's original interesting paper upon the measurement of this arc was addressed to Mr. Gilbert, M.P., Vice-President of the Royal Society in 1826. In it he pointed out the facility offered by Spitzbergen for a measurement of an arc of the meridian extending over nearly  $4\frac{1}{2}$  degrees of latitude, stating that the value of this measurement in the latitude of Spitzbergen, towards deducing the proportion of the polar and equatorial diameters by its combination with an arc near the equator, "was most important;" and adding that its value would be "equivalent to an arc in Lapland of six times the extent of the arc measured by the French Academicians."

Now the hope of the Royal Society of this measurement being at last obtained depends upon the scientific energy of the Swedish Government; but it so happens that in the expedition I urge upon your attention there might be every arrangement made for a measurement of four degrees of the meridian upon the shores of Smith Sound. I have told you that one of the ships should be left about Cape Isabella, and the other pushed on to Cape Parry, or that that point is to be considered our main station for a Polar expedition. The intervening space is rather more than four degrees; and during the summer season, whilst the Northern Expedition was absent, there could be no more profitable way of occupying those left in the charge of the ships than in doing such a work as measuring an arc; the ice of the strait, I would submit, affording considerable facilities for such an undertaking; and especial provision in the expedition might be made for such persons as were well qualified to execute it.

As late, too, as November, 1864, we find General Sabine, in his Address to the Royal Society, calling the attention of that scientific body to some recent discoveries which attest the continuation of the tropical Gulf Stream to the shores of Nova Zembla, and to a communication from Professor Forchhammer, of Copenhagen, "a valuable contribution to a great subject—the History of the Sea"—in which, by careful analysis, it is shown that, in the Atlantic Ocean, the saline ingredients in the sea-water decrease with increasing depth. This is found to hold good even to extreme depths; and the existence of a Polar current in the

depths of the Atlantic is hence inferred, since it is a well-established fact that the Equatorial seas are richer, and the Polar seas poorer in saline ingredients. Again, by analysis it has been proved that the current flowing down the east coast of Greenland has an Equatorial and not a Polar origin—a mere recurring of the Gulf Stream after rounding Spitzbergen; and the learned President fairly argued—"May it not be possible that the iceless sea teeming with animal life, described by Kane as viewed from the northern limit of his research, is, as he himself surmised, but an extension of the same Equatorial stream which produces corresponding abnormal effects at every point to which its course has been traced?" and adds, "when physical researches shall be resumed within the circle which surrounds the Pole, this, perhaps, will be one of the earliest problems to receive solution." In a recent letter to me he eloquently and justly adds, "to reach the Pole is the greatest geographical achievement which can be attempted, and I own I should grieve if it should be first accomplished by any other than an Englishman; it will be the crowning enterprise of those Arctic researches in which our country has hitherto had the pre-eminence."

# TABLE OF VOYAGES TOWARDS THE NORTH POLE.

(Compiled by CLEMENTS R. MARKHAM, Esq., Sec. R.G.S.)

Date	Captain and Ship.	Latitude.	Nature of Observation.	Authority for the Statement.	Remarks.
A.D. 1266	Normans from Gardar in Greenland.	75° 46' N.	On July 25th, when on mer. in S., the sun was not higher than that when a man lay down across a six-oared boat, stretched out towards the gunwale, the shadow formed by the side of the boat nearest the sun reached his face; but at midnight the sun was as high as when it was in the S.W. (highest) in Gardar.	Letter from a Norman named Haldor, to another named Arnold. — <i>Antiq. Anac.</i> , 'R.G.S. Journal,' viii. p. 127.	Angle formed by gunwale and man's face about 33°, lat. 75°. On July 25th, in 13th century, ☉ decl. + 17° 54'. Inclination of ecliptic + 13° 32'. Gardar is in 60° 55' N. Height of ☉ there when in N.W. at summer solstice 3° 46'; equivalent to midnight alt. of ☉ on July 25th in 75° 46' N., a little N. of Barrow's Strait.
1607	Henry Hudson.	81° 30'.	Not stated.	Asher's 'Hudson,' p. 16.	"And this I can assure at this present, that between 78½° and 82° by this way there is no passage."
1656	Two Dutchmen.	89° 0' N.	Four journals kept in the two ships, agreeing within 4 minutes.	Captain Wood's 'Voyage,' p. 145. Wood said that a Captain Goulden told his Majesty so in 1676.	.. ..
1864	William de Vlamingh.	82° 10'.	Not stated.	Commodore Jansen, 'R.G.S. Proceedings,' April 10, 1865.	N.W. of Nova Zembla.

TABLE OF VOYAGES TOWARDS THE NORTH POLE—continued.

Date.	Captain and Ship.	Latitude.	Nature of Observation.	Authority for the Statement.	Remarks.
A.D. 1670	A Dutchman.	2° beyond the Pole.	Not stated.	Moxon, hydrographer to Charles II, was told so by a sailor in a drinking-shop at Amsterdam, where he went to get a glass of beer.—'Harris,' i. p. 616.	.. ..
1690	A Dutch ship.	88° 0' N.	The captain would suffer no journal to be made.	The story was told in 1745 by Dr. Dallie, who said he was on board, to Dr. Campbell, the editor of Harris's 'Voyages.' Dallie was in Roggeveen's voyage.	Weather warm, sea free from ice, and rolling like the Bay of Biscay.
1707	Captain Cornelis Gillis, a Dutchman.	Far beyond 81° 0' N.	Not stated.	Letter from John Wallig to Messrs. Staphorst in 1775.	.. ..
1720	Captain Johnson or Monson.	88° 0' N.	Not stated.	Buffon, 'Nat. Hist.' i. p. 25. M. de Buffon was told so by a Dr. Hickman in 1730.	Barrington thinks that Dr. Halley engaged Captain Johnson to take one of his thermometers to the north, and that he reached 88°.—'Barrington,' p. 47.
	Captain Alexander Cluny.	82° 0' N.	Not stated.	'Barrington,' p. 48.	A map was engraved under Cluny's directions, with his position on it.
1744	The ship <i>Captain Guy</i> .	81° 30' N.	Obs. of captain and mate.	James Hutton, "a hardy old tar," who was on board.—'Barrington,' p. 64.	.. ..
1746	Captain Andrew Fisher, Ship <i>Ann and Elizabeth</i> .	82° 34' N.	.. ..	His own statement.	.. ..

1751	Captain MacCallam.	83° 30' N.	Obs. both with Davis and Hadley quadrants.	Story of a Mr. Watts (who was aged 17 when on board) told 20 years afterwards, the captain being dead.	Sea open to the north, not a speck of ice for the last 3 degrees.
1752	Captain John Phillips, Ship <i>Loyal Club</i> .	81° 0' N.	Obs.	His own statement.	He said that it was <i>very common</i> to fish in such latitudes.
1754	Captain James Wilson, Ship <i>Sea Nymph</i> .	82° 15' N.	Obs. of Mr. Ware, the mate.	Mr. Ware's statement.	Sea perfectly clear.
1754	Captain Guy, Ship <i> Unicorn</i> .	83° N. (June 4). 82° 3' N. (June 5).	Obs. of ☉	Statement of a Mr. Adams, who was on board.	Captain Guy's 59th voyage to those seas.
1756	Captain James Montgomery, Ship <i>Providence</i> .	83° N.	Obs.	His own statement.	.. ..
1760	Captain Humphrey Ford, Ship <i>Dolphin</i> .	81° 0' N.	Not stated.	His own statement.	.. ..
1765	Captain Vassili Tchitschagoff.	80° 30' N.	Obs. of ☉.	Pallas.	This was an expedition sent by the Russian Government to Spitzbergen.
1766	Captain Robinson, Ship <i>Reading</i> .	82° 30' N.	D. R. : computed by the run back to Hackluyt Head, in 24 hours.	His own account to Mr. Barrington.	Sea open. He thought he could have reached 83°.
1766	Captain Jonathan Wheatley, Ship <i>Grampus</i> .	81° 30' N.	Not stated.	His own account.	Three Dutch captains told him they had been to 89° N.
1768	David Boyd, Brig <i>Betsy</i> .	82° 0' N.	D. R.	His own statement. He was the mate.	Driven up by a gale of wind, beset.
1773	Captain Ralph Dale, Ship <i>Ann and Elizabeth</i> .	81° 0' N.	Not stated.	His own account.	Found much ice.

TABLE OF VOYAGES TOWARDS THE NORTH POLE—*continued*.

Date.	Captain and Ship.	Latitude.	Nature of Observation.	Authority for the Statement.	Remarks.
A.D.	Captain John Greenshaw.	82° 0' N.	Not stated.	.. ..	Nothing but a solid body of ice west of Spitzbergen. He said that "Captain John Cracroft, in the South Sea Company's time, was once so far as 83° N."
1773	Captain Robinson, Ship <i>St. George</i> .	81° 16' N.	Obs. by Hadley's quadrant "very accurate."	.. ..	He afterwards pursued a whale for five hours north, so that he thinks he reached 81° 31' N., long. 8° E. Sea open to E.N.E.
1773	Captain John Clarke, Ship <i>Sea Horse</i> .	81° 30' N.	D. R.	.. ..	Open sea to the N., with a heavy swell from N.E.
1773	Captain Bateson, Ship <i>Whale</i> .	82° 15' N.	D. R.	'Bateson's Journal.'	"A very able sea-officer is satisfied with the accuracy of his account.—'Harrington,' p. 74.
1773	Captain Phipps, Captain Lutwidge; H.M.S. <i>Racehorse</i> ; H.M.S. <i>Careless</i> .	86° 48' N.	Obs.	'Phipps's Voyage towards the North Pole.'	The expedition was sent out on the suggestion of the Royal Society and Mr. Barrington. It was found impossible to penetrate the ice north of 81°. The ice was a continued, smooth, unbroken plain to the horizon.
1774	Captain John Reed, Ship <i>Rochingham</i> .	81° 42' N.	Not stated.	His own account.	A Dutch captain, named Hans Derrick, told him that he, with five ships in company, had been to 86° N.

1806	Captain Scoresby, Ship <i>Resolution</i> .	81° 12' 42" N. 81° 30' N. (5° 10' from the Pole.)	Obs. ☉. D. R.	'My Father,' p. 161.	Navigation quite open to E.N.E. for many leagues.
1818	Captain Buchan, Lieutenant Franklin; H.M.S. <i>Dorothée</i> , H.M.S. <i>Trent</i> .	80° 34' N.	Obs. ☉.	'Barrow,' pp. 56-73.	Stopped by the ice.
1823	Captain Clavering, H.M.S. <i>Giraffe</i> ; and Captain Sabine.	80° 20' N.	Obs. ☉.	'Barrow,' p. 130.	On the east coast of Greenland, in 75° 12' N., they saw high land due north as far as 76° N. Coast 3000 feet high, with higher mountains inland.
1827	Captain Parry, H.M.S. <i>Hecla</i> ; Boats <i>Enterprise</i> and <i>Endeavour</i> .	82° 45' N. 19° 25' E.	Obs. ☉.	'Barrow,' p. 303.	The Commissioners of Longitude, in their memorial to the King, were of opinion that <i>there was</i> <i>no well authenticated account of</i> <i>any ship having gone farther</i> <i>north than 81°, except Scoresby.</i>

The usual Spitzbergen fishing-ground in the last century appears to have been between 78° and 80° N. 'The Dutch skippers replied to Mr. Harrington (in 1774), "We can seldom proceed much higher than 80½° N., but almost always to that latitude."

1853 to 1855	Dr. Kane.	80° 40' N.	? Mer. Alt. of ☉, according to Mor- ton.	Statement of Morton, the steward, who said he saw land as far as 82° 30' N., June 21st to 24th.—'R.G.S. Journal,' xxviii, p. 283, <i>note</i> .	See Dr. Rink's arguments against Kane's Polar Sea, in the 'R.G.S. Journal,' xxviii, p. 272 <i>et seq.</i>
May 18 1861	Dr. Hayes.	81° 35' N.	Obs.	'The open Polar Sea,' p. 351.	On the west coast of Kennedy Channel.





## I N D E X

TO

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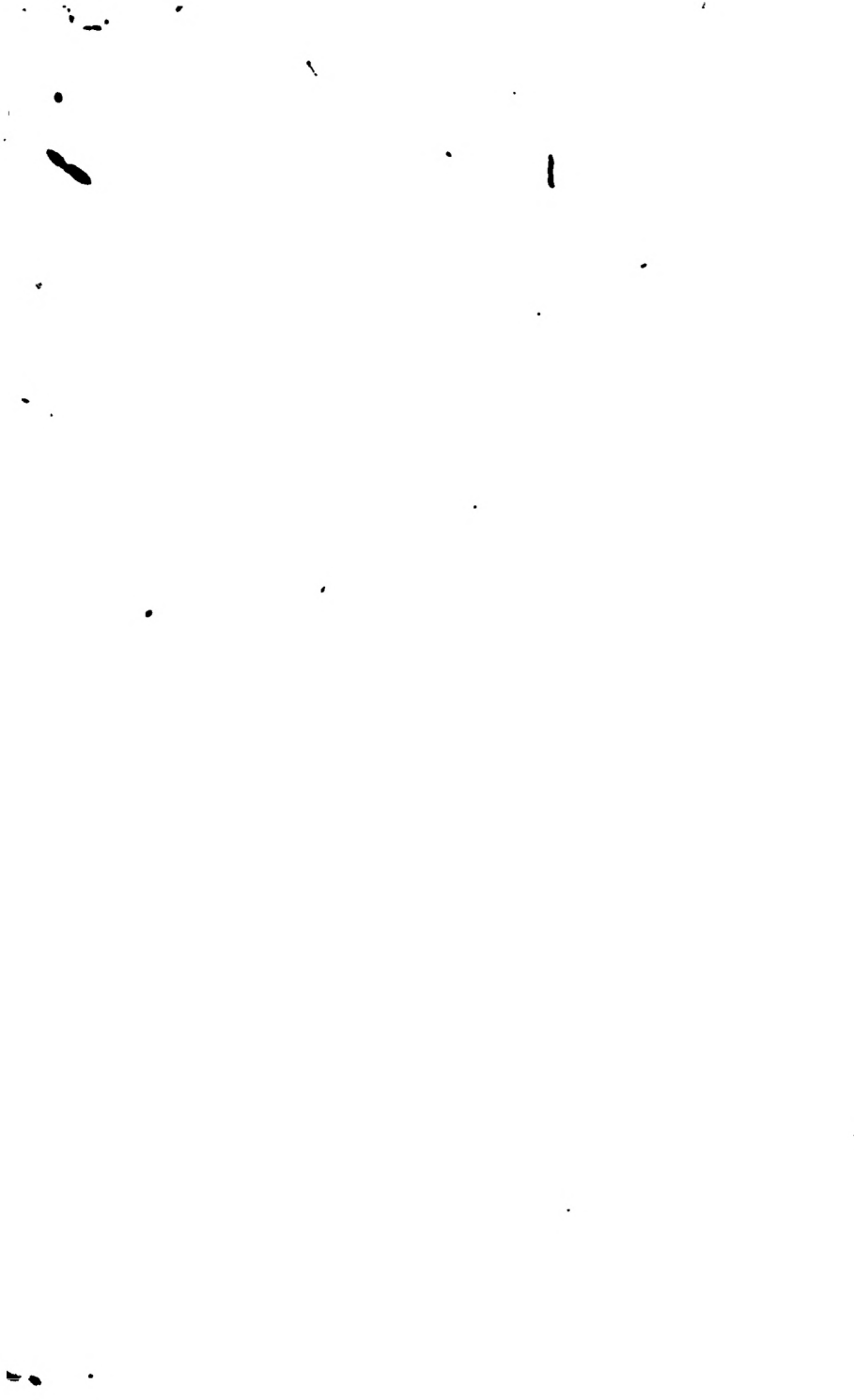
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